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WHOLE SERIES, VOL. XLIII. No. 5. THIRD SERIES, VOL. XXXV.

The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of

Practical Therapeutics

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EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year,	Two Dollars.
Canada, one year,	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year,	Ten Shillings.

E. G. SWIFT, Publisher, DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

LONDON, ENGLAND—19 & 20 Great Pulteney St., W. SYDNEY, N. S. W., AUSTRALIA—125 York St.
WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—118 St. Paul St., W.
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MEDICINE AND THE MEDICAL AGE

Whole Series. Vol. XLIII. | DETROIT, MICH., MAY 15, 1919. | Third Series. Vol. XXXV, No. 5.

ORIGINAL COMMUNICATIONS.

DILATATION AND CURETTEMENT.

BY HOWARD A. KELLY, M.D.,

Professor of Gynecology in Johns Hopkins University, Baltimore.

I suppose if I should ask the next hundred doctors I chanced to meet, "What is the simplest of all surgical operations?" the reply in almost every instance would be, "Why, dilatation and curettage of the uterus, of course." And yet because I by no means accord with that nearly universal judgment I am tempted to write this article as a sort of a sign-post, and a warning.

In order to confirm my opinion, I wrote to several friends of large experience and asked a brief opinion, and here are their replies, which I give at the very outset, in order the better to engage the attention of my readers, as I proceed with my cautionary remarks in the body of my paper.

Dr. J. Riddle Goffe, of New York, eminent gynecologist of large experience, and long connected with the Woman's Hospital, writes as follows:

"I am always gratified whenever I have an opportunity to express my opinion on dilatation and curettage.

"There is no procedure in our specialty that has been so abused as D and C. I have heard not only general practitioners but well-known specialists declare in discussion that a dilator and a curette were all the armamentarium a doctor needs to do a thriving business. One specialist here in New York has declared that every woman, after a miscarriage or confinmeent, should be curetted to insure her a healthy uterus, and he practiced what he preached, and made money thereby.

"Through the careful investigation of pathologists, we are learning that the endometrium is rarely at fault. In a series of hundreds of cases at the Woman's Hospital, the pathologist has reported, after examining the curettings, 'pre-menstrual or post-menstrual congestion'—no infection, no inflammation. The only indication therefore for the use of a curette is retained membranes and placental tissue or for diagnostic purposes, viz., confirming or eliminating a diagnosis of cancer.

"The dangers from the use of a curette, especially in inexperienced hands, are many and serious. It is a well-known fact that the irritation of a curette in the uterus frequently causes a relaxation and a thinning out of its muscular walls, thus facilitating the passage of the curette through into the peritoneal cavity. I have known this to happen in many instances. One case was reported not many years ago where an operator had thus gone through the uterine wall and unwittingly caught a coil of the intestine and dragged it down through the uterus into the vagina.

"To sum up, I deprecate the present far too frequent and inconsiderate use of the curette. It is a dangerous instrument and of service only in wise and skilful hands."

In reply to my inquiry Dr. John A. Sampson, of Albany, N. Y., also expresses the following views:

"This is my opinion as to 'dilatation and curettage,' with special reference to its dangers:

"It is not a 'cure-all' and will not cure

backache, indigestion, etc. It has a very limited field of therapeutic value, but is of value in diagnosis and treatment in selected cases. It should not be done by the general practitioner because the indications and contraindications require the judgment of a specialist, and the possible dangers are great.

"1. It may terminate a normal (desired or undesired) pregnancy.

"2. The operator may curette a patient with tubal pregnancy (diagnosis of incomplete uterine abortion). I have seen three such cases, one of which terminated fatally.

"3. There is danger of an extensive lateral tear of the cervix, but this is rather rare.

"4. The uterine wall is frequently perforated, with possibility of (*a*) internal hemorrhages; (*b*) infection; (*c*) injury to intestines. I have seen uterine fistula result from this.

"5. Spreading infection already present: (*a*) Salpingitis resulting from curettage of gonorrheal endocervicitis is common; (*b*) spread of puerperal infection.

"6. Introducing infection—not as frequent as above.

"7. Irrigations increase danger of spread of infection. The irrigating fluid may escape through tubes into the peritoneal cavity (Komak's and my own experiments).

"8. I saw one patient, brought to a hospital exsanguinated from loss of blood from a miscarriage, given a general anesthetic and curetted. The hemorrhage resulting from relaxation of the uterus at this time was sufficient to kill the patient.

"9. Curettage is often incomplete; tissue which should have been removed is left behind. I have seen this in a uterus removed after curettage.

"These are some of the points I bring out in discussing curettage with my students. They are old to you, but represent my views on the subject."

My old friend Dr. Matthew D. Mann, of Buffalo, writes:

"The principal danger is perforating the uterus. I have known of this having been done a number of times, though I never saw harm result except once, where following an abortion the uterus was perforated and the intestine torn and pulled down through the laceration. This necessitated a laparotomy, which resulted in saving the patient's life."

The opinions just cited would surely convince any unbiased jury, willing to take the statements of experts, that there surely must lurk in the so-called simple operation of "d and c" a danger not commonly suspected nor admitted by the profession at large, and that it may be fraught with possibilities for weal or woe, according to the nature of the case, or to the method of handling it.

First of all let me distinguish in this procedure not one but two distinct operations, namely, that of dilating the neck of the womb and that of curetting, or scraping out a part of its inner lining. "Scraping" and "cleaning" are terms commonly applied by the laity.

From the view-point of this operation the uterus is a muscular sac with a more or less rigid neck, the cervix, shaped like a flask, lying more or less inverted in the pelvis, possessing two physiological functions, that of menstruation and that of pregnancy, the first being a regular function and the latter an intermittent one. In the course of these activities it is liable to certain diseases which may affect either the body of the bottle or its neck, which demand prompt investigation, in the interests of health or of life itself. The commoner of these are irregularities of function, gonorrheal and tubercular infections, cancerous degenerations, mucous and fibrous tumors, and the retained products of abortions.

Sometimes the neck of the uterine bottle becomes permanently sealed, and watery, bloody or purulent secretions are retained within, forming a hydrometra, a hematometra, or a pyometra. Of these rarer conditions I do not speak at this time.

We realize best, I think, the dignity and the importance of the uterus, from the standpoint of diagnosis and treatment of its lesions, when we reflect that it is the cradle

of the whole human race, and that in the potential and actual child-bearing uteri on earth to-day lies the welfare of the whole future of our race.

The instruments used in making a complete investigation of the cervix and the body of the uterus are the following (see Fig. 1):

Speculum.
Fixation forceps.
Sound.
Dilators.
Curette.
Polyp forceps.

I shall first describe the operation of dilatation and curettage, and then speak of its fields of usefulness, and finally of its dangers, and the pitfalls to be avoided. He who does this "little operation" would do well to write as the motto over his operating-room door the Spanish words of warning, "Con Cuidádo" ("Take Care!").

A *preliminary examination* must exclude any febrile condition, or if it exists and is due to an intrauterine or pelvic condition, then the operator proceeds deliberately, knowing that he is incurring additional and sometimes considerable risk. A careful local pelvic examination must be made also to determine whether there is any trace of any lateral inflammatory disease, due to gonorrhea or other inflammation which has crept up the Fallopian tubes; here, too, a curettage is dangerous and is almost always contraindicated. Even any marked tenderness to one or other side of the uterus should be looked upon with anxious suspicion, as likely to be indicative of some focus of infection which cannot yet be distinctly felt. The next point of importance is to determine the relative positions of the

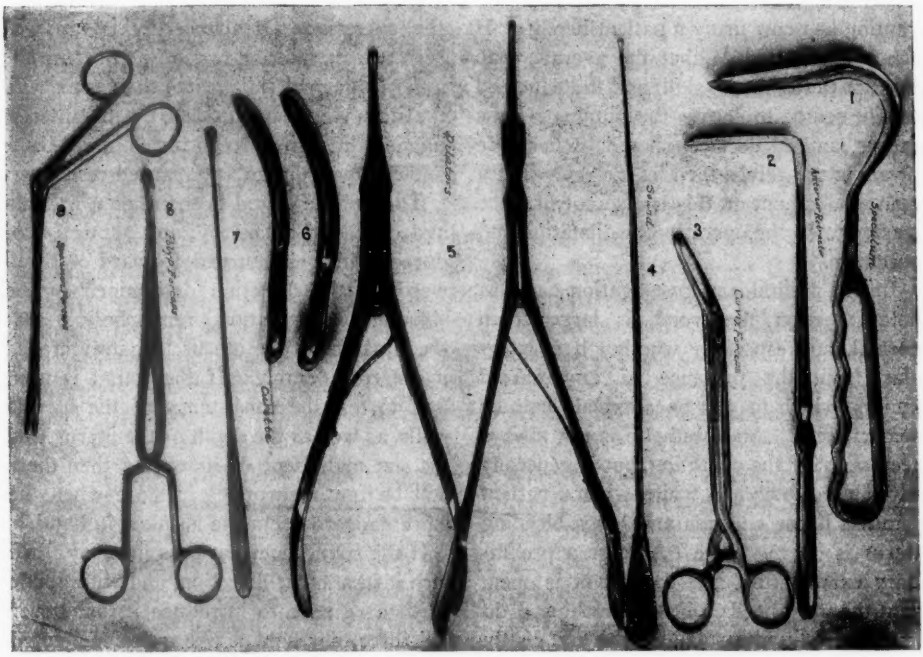

FIG. 1.—Instruments ready for use, for dilatation and curettage: (1) Sims's speculum for retracting the posterior vaginal wall. (2) Retractor to lift up anterior vaginal wall when there is a cystocele. (3) Stout-jawed Ferguson forceps for bull-dog grip holding anterior cervical lip. (4) Graduated uterine sound to measure depth of uterine cavity. (5) To the right and left of the number, uterine dilators with stout parallel blades. (6) To right and left, two of the series of Hegar dilators, sometimes used in place of the branched dilators. (7) Uterine curette. This can be serrated or sharp; when sharp it must be used with extreme care and gentleness. (8) Polyp forceps for grasping a polyp in the uterus, or removing bits of endometrium when it is abundant. (9) Forceps for snipping off a piece of the cervix for microscopic examination; this is not to be dwelt upon in this article.

cervix and the fundus of the uterus. This is vital to the operation, for he who simply takes a dilator in hand and pushes it through the cervical canal up into the uterus without this knowledge runs a great risk of perforating the organ at the angle of flexion whether the body is turned forward or backward. A neglect of this salutary precaution has cost many a patient her life. If the answer is made that the average man has not the requisite skill, and the educated tactile sense, to locate the fundus of the uterus, and to declare whether it lies fore or aft in the pelvis, then let me reply that a man who cannot do this is also not fit to be trusted to do the operation of dilatation and curettage.

In this preliminary investigation one also notes whether the womb is larger than normal, and especially whether it is irregular from the presence of any fibroid tumors, which may at once explain pain or hemorrhages. An anesthetic is not always necessary for the operation, but is generally advisable. Once in a while, when a patient who has borne children and has a bleeding uterus is on my office table for a preliminary examination, and the cervix is open, or at the most needs a little stretching, I do venture to slip in a small curette and gently take away a little of the tissue within the womb for an immediate microscopic examination. This can often be done without the patient being aware of it; but I do not recommend such a course to an amateur.

The best anesthetic by all odds is gas; as the patient goes in and out of it in a few minutes the entire brief operation is completed quickly, there is no nausea, and she recalls no disagreeable experience tending to prejudice her against any further operation in the near future. Nitrous oxide gas has the advantage of permitting the patient also to get up and go home shortly. The patient, with empty stomach, is in the dorsal position, with buttocks at the edge of the table, and thighs well flexed on the abdomen, and the gas is administered to the point of relaxation; then without delay the operator goes rapidly, skilfully and deftly to his work, losing no time.

The operation must be clean, but time must not be lost in excessive scrubbing, as is often done. Insert the Sims speculum, retract the posterior vaginal wall, and pour in a couple of teaspoonfuls of alcohol. Then take a swab or a pledget of cotton and swab out the whole vagina; then dry out the vagina with another swab and proceed with the operation. If the cervix is not well seen use an anterior retractor to lift up the anterior vaginal wall; catch the cervix with the stout Ferguson forceps, by the anterior lip, and draw it down as far as it will come without overcoming any marked resistance.

The uterine sound is then taken in hand and curved if necessary, and gently introduced, with point turned forward or backward, in the direction determined in the bimanual examination, remembering that the traction on the uterus has straightened it out considerably. If the sound is used first to test the consistency of the uterine walls, as well as the depth of the uterus, and the size and shape of its cavity, then there will be fewer surprises in store when the more dangerous curette is taken in hand.

If the sound does not pass in easily, then turn it in another direction, and with gentle persistence seek to introduce it, but never use force, nor hold it like a rapier pointed at an adversary whom it is your fell intent to perforate with the blade. In the average uterus it ought to go in for about seven centimeters. Mark the point on the shank, and record the depth of the uterus as part of your record of the occasion and the case. If you don't keep any records, then don't give anesthetics, and don't curette patients in these days. We owe it to every woman who consults us to keep at least a brief, accurate, carefully made memorandum of her visit, and of our findings, and we owe it, too, to ourselves, for it makes for habits of care and accuracy in all our work.

The next step is the dilatation. Holding the cervix drawn well down, the smaller dilator (see Fig. 1) is grasped lightly between thumb and first and second fingers and slid slowly into the uterus in the determined direction, and then when the blades are well in the handles are squeezed

together and the dilatation effected, without using much force; rather, moderate pressure is to be used, like that of a good firm grip of the hand to a parting friend, relaxing and repeating it several times, until the maximum enlargement is secured. Then the next sized dilator is taken and the dilatation is carried still farther, until the canal is open enough to permit the introduction of the curette, or until a bougie about eight or nine millimeters in diameter can be passed with ease.

Let me utter here the earnest caution against the use of any sharp-pointed, much-curved dilator, an instrument sure to get him who wields it into trouble sooner or later. Also avoid any dilator which feathers easily. Choose one which is rigid, and but slightly curved; to test it grasp the points firmly between your fingers and hold them, while you squeeze the handles, and as the handles move the points ought to force your fingers apart.

A surgical abomination is a three-pronged dilator; turn away from it with horror and never even look in that direction.

If an anesthetic is given it needs three persons to do well a dilatation and a curettage. This is one reason why abortionists have so many troubles and attention is so often drawn to their murderous practices, as they dare not bring the necessary number of persons into contact with the case in order to do their work well. Moreover, a man who lives with an evil conscience as a rule is also apt to be slipshod in his methods and sloppy in his technique. I commonly have four assistants, one for the anesthesia, one to hold each leg, and a fourth to hold the forceps grasping the cervix. I well remember, however, the earlier days, when I did my first work, using the patient's bed for a table, and holding her legs up on her abdomen by an umbrella through the popliteal spaces, pulling the limbs up by means of a sheet around one end of the umbrella, carried up around the neck and over the shoulders, and fastened to the other end of the umbrella. Those were more or less pioneer days, and such methods are not excusable to-day, for they entail risks.

Dilating the cervix is step number one, and now step number two follows immediately. Remember that unless the uterus is softened as by pregnancy you cannot safely dilate so as to get your finger in, as you would like to do. If you try to do it you will rupture the cervix out into the broad ligament and get into lots of serious trouble. The exposure of the interior of the uterus calls for a cutting operation. The curette is next taken in hand and carried up through the opened canal and used to rake the inner surface of the uterus, at first gently and as it were questioningly, until the operator knows just what kind of tissue the body of the uterus is made of. This is the most dangerous step in the operation, so remember that the end of the curette must be both eyesight and touch through your fingers. A little curettage in a normal uterus promptly gets down to a firm creaking (called by the French *cri uterin*) base, almost like cartilage. Always remember, however, that the body of the uterus may be just like wet blotting paper, and in each case your only safe plan is to assume at the outset that you have here just one of those dangerous, difficult cases to deal with, until your careful palpating manipulation has proved the contrary. As a rule the use of the sound has paved the way for you and given you a large measure of assurance. As the curette does its work some blood flows out and some of the lining membrane of the uterus escapes intermittently out of the os uteri into the vagina, where it may be caught in the hollow of the speculum. Try also as you use the curette to get an idea of the size of the uterine cavity, and of any irregularities, and especially if it is a bleeding case, to discover whether there seems to be any polyp or tumor projecting into the cavity.

Take the polyp forceps in hand, after using the curette, and introduce it and open and close the blades in several directions, pulling a little, to see if perchance there is not some mucous polyp or fibroid tumor there, which you may be fortunate enough to engage and remove. In a fairly long series of such examinations every once in

a while you will be rewarded by catching one and so simply terminating a long period of illness.

The third step is perhaps the most important of all, and the one to which as a rule the other two only look forward. I refer to the transfer of the specimen secured by curettage to the bottle containing a ten-per-cent solution of formalin, which sets the tissues for the pathologist. The pathological examination of the curetted material is a duty we owe to every patient who comes to us ignorant of the details of our procedure but trusting us to do for her all that modern medical science puts it in our power to do in the way of diagnosis and therapy.

Catch up all the material secured by the curettage in the hollow of the spculum, and

FIG. 2.—Bottle containing 10-per-cent formalin in which the uterine curettage material is placed immediately on removal, to be sent to a pathologist for microscopic examination and report. A much smaller bottle can be used more conveniently for mailing purposes.

dump it into the wide-mouthed bottle, properly labeled with the data seen in the photograph (Fig. 2), and send it with some clinical data to a competent pathologist for an opinion.

The operation is now done. Do not wash out the uterus as we used to do in every case, and do not put any drain into it, nor use any vaginal drain. Simply push the cervix well back into the sacral hollow, and release the traction forceps, and turn the patient over to the trained nurse. A miserable, weak patient, or one who has lost much blood, should be kept in bed for several days, say from five to seven; if it is imperative, however, after an ordinary operation she may sometimes leave the hospital a few hours later or the next day.

If the operation has been nothing more than a dilatation for dysmenorrhea, she may go home in an hour or two.

I shall not hesitate to emphasize these important, and sometimes vital, matters by repetition; therefore let me say, in a general, critical way, as an estimate of the value of dilatation and of curettage, that in a dysmenorrhea, which is extreme and persistent, dilating the cervix thoroughly is often of the greatest value, either in removing the pain entirely (which it rarely does) or in mitigating it, and making it bearable. Note well, however, that in the average young girl, who is only invalided from a few hours to perhaps a day each month, not only ought no operation to be done, but she ought not even to be examined by the vagina. If you must examine use the rectum.

The relief of the dysmenorrhea by dilating is irrational therapeutics, nevertheless it works, and that is what the patient wants—cure rather than correct theory. In the rare extreme agonizing dysmenorrheas, which yield to none of our ordinary measures, I employ radium inserted in the womb to stop menstruation for a time, a method vastly better than the ablation of the ovaries, which we used to do. For serious persistent hemorrhages in younger women, I have found an excellent remedy in repeated curettages. If the bleeding is inveterate, then at each period, after a couple of days of menstruation, the patient comes to the hospital for a prompt curettage, without waiting until she feels the loss. She stays a couple of hours and then goes home. This can be repeated many times at intervals of a month or so without the slightest risk and with extraordinary advantage. One of my patients who had been told by one of the greatest surgeons in America that she must have a hysterectomy, at the age of about sixteen, is now the mother of numerous progeny, the first being twins!

Again, in sterility dilatation is more or less irrational, but as a matter of fact it works marvelously in many cases, where no obvious impediment can be found in the woman, and where the husband is not at fault. In curetting the incomplete abortions, as soon as a little broken or somewhat mushy tissue with little clots of blood begin to come out of the cervix, it would be safer to lay aside the curette and take the polyps forceps in hand and with the utmost gentleness to grasp only projecting masses and cautiously to withdraw or sneak them away, feeling over the inside of the uterus, with such care that it would not be perforated even if it were like the wet blotting-paper, as so often described.

I have been astonished to learn that in some parts of the country it is a general practice to curette all abortions (see Dr. Goffe's letter). This is a most pernicious custom, and deserves unqualified condemnation. One might just as well insist on using the obstetric forceps to assist every birth. If a curettage is done one must be able to allege a particular reason for resorting to it. Nature must always first be given a fair chance to empty the womb and to adjust matters back to normal herself; the position of the doctor ought always only to be one of armed neutrality, as unwilling to interfere, yet ready in case of necessity, which means in case of too great or too prolonged hemorrhage, or any febrile disturbance.

In abortions where the cervix is open enough to admit the finger of the gloved hand, this, carefully used, forms perhaps the best of all curettes, as it sweeps over the whole of the interior of the uterus and wipes off any clinging tissue and leaves a smooth wall and the assurance that all the ovum is removed, and obviates the use of the curette.

In cancer of the body of the uterus, the tissue comes away in irregular pieces, whitish, and mixed with old blood, if the disease is advanced, but in the earlier stages nothing but the microscope can decide. In all cases, I repeat, send your tissues to a competent miscroscopist for a decision.

There are some six dangers connected with dilatation and curettage. These are: (1) Pulling down the cervix and rupturing an unsuspected pelvic abscess; (2) rupturing the cervix out into the broad ligament by overzealous dilatation; (3) perforation of the fundus with the uterine sound; (4) perforation of a retroflexed uterus with a dilator; (5) perforation of the anteflexed uterus with a dilator; (6) tearing a hole in the fundus of the uterus with the curette.

Let me speak of each of these seriatim, with a little case-book illustration to keep the matter clearly in mind while we are discussing the subject.

1. *Pulling the uterus down and rupturing an abscess.* This was a far more vivid danger in the days of the generation immediately preceding my own, before men at large, or even specialists, had learned to use the bimanual examination with skill, and to interpret their findings in the light of many experiences. You men of the present generation who have unconsciously absorbed what the men of the preceding generation have handed over to you, and to whom it all seems so easy and so natural to determine whether or no there is an abscess in the pelvis, can hardly realize all we went through that we might transmit to you what

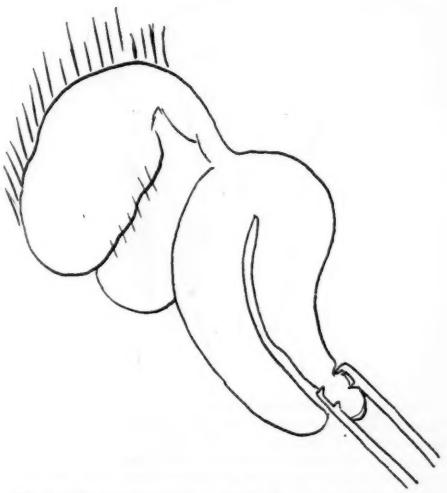

FIG. 3.—The uterus being pulled down for dilatation and curettage; above there is an inflamed tube and ovary with pus in the tube. The traction in such a case is liable to bring on an attack of peritonitis and might cause death.

is now so obvious, that you take it all for granted. You will avoid this serious accident if you will always examine the patient carefully as soon as she is relaxed, and before you begin your dilating operation. If you have reason even to suspect an abscess, and cannot positively veto the suspicion, do not operate.

2. *The risk of rupture of the cervix.* Never use a dilator with a screw arrangement to force the handles apart. Always judge the amount of force being used by the intermittently applied pressure of your hands—that is the only safe guide. And moreover do not be too ambitious to secure a big dilatation. It is enough to be able to

FIG. 4.—A tear through the cervix out into the left broad ligament with hemorrhage into the ligament, caused by too vigorous use of the dilator, in the effort to effect too wide a dilatation. The uterine sound has been carried by the inexperienced operator up through the top of the broad ligament into the peritoneal cavity. This represents an actual case.

get your curette in without difficulty. The danger of rupture is really great in the old, and in this class you must often accept a lesser degree of dilatation as satisfactory.

3. *Perforation with the uterine sound.* If the sound suddenly goes in deep, up to the hilt, withdraw it at once, and do not introduce it again and again in order to demonstrate the fact, but accept the well-grounded suspicion as a complete demonstration that the womb is perforated and say *"noli me tangere"* as to further manipulations and let the uterus alone. In 35 years I have put my sound through the fundus repeatedly, and I have never yet seen any harm come of it. One zealous explorer recorded in the literature got his sound in so far that it was lost in the abdomen and had to be fished out!

4 and 5. *The perforation of the uterus at its junction with the cervix by the dilator.*

FIG. 5.—Perforation of the fundus of the uterus with a sound, a common accident.

This is easily avoided by knowing the position of the fundus as revealed by the bimanual examination, and by turning the blunt points of the dilators either forward

FIG. 6.—Perforation of the posterior wall of the uterus with a dilator, in the effort to dilate an acutely anteflexed uterus, without determining beforehand the anterior position of the fundus.

or backward during the introduction, and allowing a little for the straightening of the organ by the traction on the cervix. I saw a sad case of this accident early in my experience. It was in Port Richmond, Philadelphia, and a criminal abortion had been done by an ambitious doctor with no moral sense, who came to my office one day and made a plausible excuse to borrow my in-

struments to do his work. A few days later he called me over from Kensington in consultation to see a young girl who had peritonitis. When I operated I found the uterus, which was in anteflexion, perforated at the cervical junction, and through the

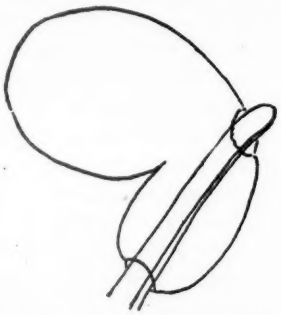

FIG. 7.—Perforation of the anterior wall of the sharply retroflexed uterus, made by thrusting the dilator up in the direction in which the normal uterus should lie, without previously recognizing the retroflexion.

rent he had poked a laminaria tent. Needless to say she died. Alas, that so many such men so regularly escape their merited punishment!

6. *Tearing a hole in the fundus of the uterus with the curette.* This is the very worst of all the accidents and the most dangerous. It is often ascribed to the use of a sharp curette, but I doubt if the kind of a curette used has anything to do with it. It is rather due to the failure to recognize the fact that the uterus is in a peculiar state of softening due to fatty degeneration and necrosis of the muscle fibers, or that the wall may be extremely thin due to the disappearance of the muscle fibers, converting it into a sort of a "membranous uterus." Some examiners describe an edematous infiltration of the walls. Whatever the condition may be it is enough to remember that it is usually associated with an abortion, and to bear the fact in mind every time you curette, and to go slow until you are sure as to the quality of firmness of the walls.

Over and over again deaths have occurred from this cause. I recall two in my own clinic within the last thirty years, the first one about twenty-nine years ago and the last one last fall, both in the hands of men who were doing these operations constantly. I feel as though somehow such an accident ought not to happen, or if it did occur that it ought to be recognized, but that it does happen at long intervals in good hands cannot be denied, and harsh criticism is silenced.

If the curette passes up into the depths, and a perforation is even suspected, stop at once and keep the patient quiet and watch her carefully for a couple of days; if she develops anything more than a slight fever, open the abdomen and either sew up the hole and drain or do a radical operation; in any case if there is peritonitis, drain. Do not do as was done in a clinic in a rural hospital, where the doctors boasted of their acuteness in the diagnosis of a perforation.

FIG. 8.—The tear in the fundus of the uterus produced by a curette, through which omentum or bowel may prolapse. A tyro has repeatedly used his forceps to pull down some feet of bowel through such an opening, and *mirabile dictu*, has then proceeded to cut it off!

"When the douche nozzle was turned in one direction all the fluid came back, but turned in the other direction none of it came back, and so it must have gone through the hole!" The abdomen was opened and the suspicion was confirmed, and the patient saved. The risks from a perforation have been lessened by giving up an evil practice formerly much in vogue, namely, that of irrigating the uterus after the curettage with sublimate, or with some other corrosive or styptic solution. If called in to see a patient who has been curetted and who is

believed to have been perforated, if the cervix is open I would carefully examine the interior of the uterus with my gloved finger, and if the examination was satisfactory in not disclosing any opening large enough to be felt I would wait and watch, but in the event that I discovered the rent I would operate at once. Also in a septic case I would operate more promptly. Waiting to operate when symptoms arise risks waiting too long, as in a case in the hands of Hermann Boldt. Here the bowel was alleged to have been pulled through the rent and torn and returned when Boldt was called in. He doubted the history and waited, and there were no symptoms for fifty hours; then he operated immediately, but the peritonitis was too advanced, and the patient died.

Sometimes, in the curettage of a cancerous cervix, it is impossible to avoid making a hole into the peritoneum. When this is done it is time to apply this surgical paradox, namely, that a big hole is far less dangerous than a little one, so proceed at once to enlarge the opening and slip in a drain for a couple of days. It seems almost unbelievable, but it is nevertheless true that the fundus of the uterus has repeatedly been torn open and the bowels have prolapsed into the vagina, and the befuddled operator has even proceeded to pull out more bowel and then to cut it all off by the foot or by the yard! In this way over fifteen feet of bowel have been sacrificed. With a timely operation in some cases life has been saved by opening the abdomen and anastomosing the remaining bowel.

In more than one case the unhappy operator thought he was pulling away the intestines of the fetus. Twice the omentum is known to have prolapsed, and plugged the hole, fortunately keeping out the bowel. In case of a grave injury the only course is to open the abdomen at once and close the rent, and to drain whenever in doubt.

A seventh danger to which I might call attention is that of curetting off the entire lining membrane of the uterus down into the muscle, and in this way causing a complete cessation of menstruation with atrophy. This has occurred abroad, but I am not aware of any case reported from this country.

All that I have said above has not been to alarm but to warn the wise to be careful and not to esteem any surgical operation trifling, least of all a dilatation and a curettage; and to urge the principle of doing all surgical work deliberately, and with great care and painstaking attention to every detail at every step.

SPECIFIC TREATMENT OF TUBERCULOSIS, WITH CASE REPORTS.[1]

BY GILBERT T. BROWN, M.D., DAYTON, OHIO.

In reporting my continued experiences in the specific treatment of tuberculosis since the presentation of my paper on this subject at our meeting on February 2, 1917, I may remind you that in its discussion it was suggested that its application in the welfare work of our city, and especially in children, would be desirable. Accordingly I took the matter up with the Health Commissioner, and permission was granted to select certain cases from those who had been knowingly exposed to tuberculous infection, and the following cases were taken from this class. The cases were treated with vaccine against tuberculosis made in the laboratories of Dr. Karl von Ruck in Asheville, N. C., who supplied it free of charge for this charitable work. No other treatment was used, unless so stated in the report of individual cases which follow below. In the same period I have completed seventeen cases in my private practice which I tabulate separately.

[1]Read before the Montgomery County Medical Society, January, 1919.

24 CASES FROM WELFARE DEPARTMENT.

Case 1.—Mr. C. L. C., aged twenty-one. History of family exposure. Health failed since December, 1915.

Present condition: General weakness; headache; dizziness; digestive disturbances;

slight albuminuria; temperature 99.4°; weight 128 pounds.

Physical examination: Infiltration left upper lobe.

Treatment: Tubercle bacillus vaccine, three months, fifteen doses, 0.05 Cc. to 0.7 Cc., caused general and focal reactions.

Result: All symptoms disappeared; urine normal; temperature normal; weight 136½ pounds, gained 8½ pounds. Feels well and able to work. Infiltration of left lung disappeared. Continues in good health. "Apparently recovered."

Case 2.—Mrs. N. M. S., aged thirty-seven (widow). Husband died of tuberculosis. Had night sweats a year ago; been complaining since.

Present condition: General malaise; digestive disturbances; slight cough and expectoration; temperature 99.5° to 100.5°; weight 127 pounds.

Physical examination: Tuberculous infiltration both upper lobes with destructive lesion on left side, pleurisy at base.

Treatment: Tubercle bacillus vaccine, eight months, thirty-four doses, 0.05 Cc. to 1.4 Cc., followed by general febrile and focal reaction in both lungs.

Complications: Diplococcus infection, which yielded promptly to diplococcus vaccine.

Result: Lost all symptoms; temperature normal; weight 145 pounds, gained 18 pounds. Infiltrations in lungs cleared up; destructive lesion healed; no cough; no sputum. Apparently recovered.

Note: Patient has married since discharge; continues in good health.

Case 3.—J. S., aged six (son of case No. 2).

Present condition: General malaise; cough; pain in right side; temperature 99° to 100°; weight 43 pounds.

Physical examination: Infiltration apex right lung and pleurisy at base; hip-joint disease; tenderness of second dorsal vertebra; right cervical glands enlarged.

Treatment: Tubercle bacillus vaccine, eight months, thirty-four doses, 0.02 Cc. to 0.75 Cc.; marked general and focal reactions in hip-joint and second dorsal vertebra; also in right lung after first dose, and similar reactions to several subsequent doses; thereafter the reactions were slight, and none were noted toward end of treatment.

Result: No symptoms. Infiltration of right lung and signs of pleurisy disappeared; evidence of disease of hip and spinal tenderness disappeared also; patient feels well; temperature normal; weight 47 pounds, gained 4 pounds. Apparently recovered.

Case 4.—M. S., aged four (daughter of case No. 2). Had influenza two months ago, followed by persistent cough.

Present condition: Listless and tired; cough; pain in right hip; temperature 99.2°; weight 34 pounds.

Physical examination: Left apex infiltrated; right hip tender on pressure and motion.

Treatment: Tubercle bacillus vaccine, two months, eight doses, from 0.02 Cc. to 0.2 Cc.; general, febrile and focal reaction in right hip and lung; none to last several doses.

Result: All symptoms disappeared; lungs normal; no pain in hip; temperature normal; weight 37 pounds, gained 3 pounds. General condition good. Apparently recovered.

Case 5.—L. P., aged twenty-nine. Had persistent cough eight and a half years ago; health has failed since. Three months ago had influenza; is now unable to work.

Present condition: Cough and expectoration; general malaise; gastric disturbances; temperature 99° to 102°; weight 133 pounds.

Physical examination: Involvement both upper lobes; destructive signs right apex; right cervical glands enlarged.

Treatment: Tubercle bacillus vaccine over a period of six months; twenty-six doses, from 0.05 Cc. to 1 Cc. Reactions marked general and focal in both lungs, growing less and lacking toward end of treatment.

Result: Left lung normal; destructive process in right lung arrested and healed; lymph glands not palpable. All symptoms disappeared; temperature normal; weight

143 pounds, gained 10 pounds. Apparently recovered.

Note: Gained subsequently 7 pounds; condition remained good; died of pneumonia in recent epidemic.

Case 6.—A. P., aged nine (son of case No. 5). Is subject to frequent colds; delicate; anemic.

Present condition: Cough; malaise; temperature 99.5° to 100° F.; weight 57 pounds.

Physical examination: Right upper lobe infiltrated; right cervical glands enlarged.

Treatment: Tubercle bacillus vaccine, three months, twenty-one doses, 0.04 Cc. to 0.5 Cc.; marked reactions in beginning; slight or no reactions toward end.

Result: All symptoms disappeared; infiltration in right lung cleared up; glands not palpable; temperature normal; weight 64 pounds, gained 7 pounds. Apparently recovered.

Note: Remains in good health since.

Case 7.—Miss F. D., aged seventeen. No family history. General decline of health for last three months.

Present condition: Cough and expectoration; insomnia; weakness; easily fatigued; complains of rheumatic pains; disordered digestion; loss of weight; temperature 99° to 100°; weight 95 pounds.

Physical examination: Left upper lobe infiltrated; râles anterior and posterior; both cervical groups of lymph glands enlarged.

Treatment: Tubercle bacillus vaccine, three months, fourteen doses, 0.05 Cc. to 0.33 Cc.; marked reactions general and focal. Discontinued treatment.

Result: Physical signs diminished; no râles; symptoms greatly improved; rheumatic pains disappeared; slight cough remains; temperature normal; weight 100 pounds, gained 5 pounds. Greatly improved.

Case 8.—Mr. W. T., aged twenty-nine. Decline in health for last two months; hoarseness; cough and expectoration; shortness of breath.

Present condition: Same as stated above; temperature 99°; weight 132 pounds.

Physical examination: Right apex, percussion dulness and bronchial respiration; base of right lung, pleurisy and râles.

Treatment: Tubercle bacillus vaccine, one month, four doses, 0.05 Cc. to 0.15 Cc.; marked general and focal reaction, including seat of pleurisy. Patient stopped treatment on account of severe reactions.

Result: Determined two months after discharge. No symptoms; no physical signs; temperature normal; weight 145 pounds, gained 13 pounds. Apparently recovered.

Note: Examined again six months later; no change found; has remained well.

Case 9.—Miss G. De W., aged fifteen. Father died of tuberculosis three years ago. Loss of appetite and general decline for last two or three months.

Present condition: Cough; nervous; easily fatigued; temperature 99°; weight 64 pounds.

Physical examination: Slight infiltration both apices; cervical glands enlarged on both sides; pleural crepitations at base of right lung.

Treatment: Tubercle bacillus vaccine, six weeks, eight doses, 0.03 Cc. to 0.3 Cc.; only slight reaction except third dose, which was marked, general and focal.

Result: Physical signs disappeared; no symptoms; temperature normal; weight 66 pounds, gained 2 pounds. Cervical glands smaller, but still palpable. "Greatly improved."

Case 10.—Mr. S. A., aged forty years. General decline for last three years. Has had bronchial asthma since then.

Present condition: Cough and expectoration; asthma; night sweats; digestive disturbances; unable to work; temperature 100°; weight 126 pounds.

Physical examination: Dulness in right and left apices; entire chest full of râles.

Treatment: Tubercle bacillus vaccine, seven months, forty doses, 0.05 Cc. to 1.7 Cc. Reactions marked general with fever; focal reactions noted after râles had disappeared.

Result: Asthma disappeared without other treatment; no physical signs remained; other symptoms disappeared also;

temperature normal; weight 147 pounds, gained 21 pounds. Patient is strong and well and returned to work. Apparently recovered.

Note: Patient continues well.

Case 11.—Mr. G. H., aged forty-two. No family history. Health declined since four years ago.

Present condition: Complains of cough and expectoration; exhaustion; night sweats and loss of weight. Patient had a rib resection; fistula still discharging; temperature 102°; weight 178 pounds.

Physical examination: Right lung shows percussion dulness and râles in upper portion; no respiratory sounds below fourth rib; fistula in sixth interspace of axillary line, discharging about three ounces in twenty-four hours. Left lung apex shows destructive change (cavity) with moist râles and rhonchi; lower lobe normal.

Treatment: Tubercle bacillus vaccine, one year, fifty doses, 0.05 Cc. to 1 Cc.; reactions general and focal; fistulous discharge increased under reactions. Patient was also given stock vaccine for mixed infection.

Result: No material change in right lung; fistula still discharging about half as much as a year ago; left lung, percussion signs diminished; no more râles; cavity is dry. Lost 24 pounds during first five months; then gained to present weight, 168 pounds. Temperature irregular, not exceeding 99.5°. "Improved."

Case 12.—V. S., male, aged twelve. Father died of tuberculosis three years ago. Has declined in health last two years.

Present condition: Cough and expectoration; loss in weight; painful swelling of right tibia; temperature 100°; weight 70 pounds.

Physical examination: Both upper lobes show infiltration; moist râles on right side; cervical glands enlarged both sides; right tibia swollen, inflamed, red, and painful; had been operated on two years before.

Treatment: Tubercle bacillus vaccine, nine months, forty-one doses, 0.03 Cc. to 1.1 Cc. Reactions marked general and focal in both lungs; tibia began to react focally after doses had been increased to 0.8 Cc.

Result: Lungs free from physical signs; lymph glands disappeared; tibia improved greatly; patient discontinued treatment against advice; weight 90 pounds. "Greatly improved."

Case 13.—Mrs. A. K., aged thirty-seven. No family history. Health declined since pneumonia two years ago.

Present condition: Emaciation; temperature 100° to 102°; cough and expectoration; weight 100 pounds.

Physical examination: Moderate infiltration right upper lobe with râles; pleurisy at base; left lung slight infiltration in apex, râles posterior and in lower lobe.

Treatment: Stock vaccine for mixed infection, which caused improvement in fever; tubercle bacillus vaccine, six months, twenty-five doses, 0.05 Cc. to 1 Cc.; reactions general and focal, marked in earlier period of treatment.

Result: Lungs normal; temperature normal; weight 127 pounds, gained 27 pounds. Apparently recovered.

Note: Patient died about three months after discharge, from rupture of fallopian tube.

Case 14.—O. C., male, aged eleven. Sister died of tuberculosis about one year ago. Health began to decline about that time.

Present condition: Cough and slight expectoration; loss of appetite and general weakness; spinal pain; temperature 99°; weight 69 pounds.

Physical examination: Slight infiltration of left apex; râles on coughing; pain and tenderness of upper dorsal vertebra; both cervical groups of lymph glands enlarged.

Treatment: Tubercle bacillus vaccine, two months, ten doses, 0.04 Cc. to 0.2 Cc.; reactions marked; focal reactions in lungs and vertebra; general reaction rather severe.

Result: Râles in left apex disappeared; percussion note normal. Pain and tenderness of vertebra disappeared. Temperature normal; weight 75 pounds, gained 6 pounds. Apparently recovered.

Case 15.—R. C., aged thirteen (brother of case No. 14). Health declined since six months ago.

Present condition: Cough with slight expectoration; digestive disturbances; temperature 99° to 101°; weight 75 pounds.

Physical examination: Infiltrated area of left apex with râles; markedly enlarged left cervical glands; last cervical and first dorsal vertebra tender to pressure.

Treatment: Tubercle bacillus vaccine, two months, ten doses, 0.05 Cc. to 0.3 Cc.; marked general and focal reactions in lung lesion. Spinal pain increased under reactions.

Result: On dismissal still signs of infiltration in left apex; no more râles; lymph glands still palpable; temperature normal; weight 85 pounds, gained 10 pounds.

Reëxamined after three months: lungs normal; glands not palpable; weight same; feels well. Apparently recovered.

Case 16.—Miss D. S., aged fourteen. Father died of tuberculosis two years ago. Her health began to fail about two months ago.

Present condition: Slight cough, feels tired; temperature 99.2°; weight 65 pounds.

Physical examination: Slight infiltration left apex; no râles; left cervical glands enlarged.

Treatment: Tubercle bacillus vaccine, three months, fifteen doses, 0.04 Cc. to 0.5 Cc.; few reactions, general and focal, after increase of doses.

Results: Lung normal; glands disappeared; temperature normal; weight 70 pounds, gained 5 pounds. "Apparently recovered."

Case 17.—Miss F. K., aged eighteen. No family history. Health began to decline a year ago.

Present condition: Slight cough; loss of appetite and weight; exhaustion.

Physical examination: Marked infiltration right apex; râles posterior; left apex an apparently old lesion without râles; temperature 100°; weight 112 pounds.

Treatment: Tubercle bacillus vaccine, three months, fifteen doses, 0.05 Cc. to 0.5 Cc.; reactions moderate general and focal, first five doses; thereafter only on increase of dose.

Results: Right apex nearly clear; dulness and retraction over lesion of left lung; no more cough; temperature normal; weight 120 pounds, gained 8 pounds. Feels well. "Greatly improved."

Case 18.—G. S., female, aged twelve. No family history; had spinal meningitis four years ago; declined in health since six months. Pain in right knee.

Present condition: Slight cough; loss of appetite; tires easily; temperature 99.6°; weight 58 pounds.

Physical examination: Slight infiltration in both apices; both cervical groups of lymph glands enlarged.

Treatment: Tubercle bacillus vaccine, four months, seventeen doses, 0.02 Cc. to 0.25 Cc. Reactions marked general and focal in lungs, right knee, and throat.

Results: Lungs normal; cervical glands disappeared; temperature normal; weight 60 pounds, gained 6 pounds. Patient discontinued treatment on account of severe reactions. Greatly improved.

Case 19.—W. H., male, aged six years. Father has tuberculosis. Health declined for last six months.

Present condition: Listless and dull; anemic; exhausted; temperature 99°; weight 36 pounds.

Physical examination: Slight infiltration apex of left lung; much enlarged cervical and axillary lymph glands.

Treatment: Tubercle bacillus vaccine, five weeks, seven doses, 0.02 Cc. to 0.1 Cc. Reactions general and focal well marked.

Results: Lungs normal; lymph glands not found; temperature normal; weight 40 pounds, gained 14 pounds. Examined two months later; no change. Apparently recovered.

Case 20.—Mrs. M. T., aged sixty. Husband died of tuberculosis ten years ago. Has been in poor health since.

Present condition: Cough and expectoration; feels weak and exhausted; temperature 99.6°; weight 86 pounds.

Physical examination: In both lungs destructive changes, with râles and rhonchi to

third or fourth rib anterior and posterior, but somewhat less marked on left side.

Treatment: Tubercle bacillus vaccine, seven months, thirty-four doses, 0.05 Cc. to 1 Cc. Reactions general and focal, slight or moderate.

Results: Feels much better; physical signs diminished; temperature about same; weight 92 pounds, gained 6 pounds. Improved.

Case 21.—Mrs. B. S., aged twenty-three. Family history of tuberculosis. Health declined since two years ago.

Present condition: Cough and expectoration; night sweats; anemic; insomnia; impaired digestion; temperature 100°; weight 95 pounds.

Physical examination: Right upper lobe slight infiltration; no râles. Left upper lobe destructive area and râles.

Treatment: Tubercle bacillus vaccine, four months, twenty-four doses, 0.05 Cc. to 1 Cc.

Result: Patient improved for four months, when a pelvic infection increased fever to 102°, after which patient lost ground; specific treatment discontinued. Stock vaccine for pelvic infection substituted, without benefit. Patient died.

Case 22.—Miss V. T., aged sixteen. Mother and brother died of tuberculosis within two years. Her own health declined slightly last two months; pulmonary hemorrhages three days ago.

Present condition: Slight cough; loss of appetite; feels tired; temperature 99°; weight 112 pounds.

Physical examination: Marked infiltration right upper lobe; râles posterior; left lung free.

Treatment: Tubercle bacillus vaccine, seven weeks, 0.03 Cc. to 0.25 Cc. Reactions general, slight, focally well marked.

Result: Right lung, no râles; harsh inspiration remains in apex posterior. Temperature normal after first month. Weight 120 pounds, gained 8 pounds. No symptoms; feels well. Greatly improved.

Case 23.—Mrs. A. P., aged twenty-two. Sister died of tuberculosis. Health good until two months ago.

Present condition: Slight cough; weak and nervous. Temperature 99°; weight 125 pounds.

Physical examination: Left apex, slight infiltration; very large cervical glands on left side.

Treatment: Tubercle bacillus vaccine, two weeks, two doses, 0.05 Cc. and 0.1 Cc. Reactions slight, general and marked focal in lungs and cervical glands after both doses. No further treatment.

Result: determined one month later. Lung infiltration markedly diminished; lymph glands smaller. Temperature normal; weight, no record. Patient thinks she has materially improved. "Greatly improved."

Case 24.—M. L., male, aged ten. Father died of consumption four years ago. Patient had at that time marked cough, from which he recovered; cough returned one month ago.

Present condition: Feels tired; has slight cough; temperature 99° to 100°; weight 55 pounds.

Physical examination: Slight infiltration left upper lobe between second and third rib anterior; mitral insufficiency; enlarged cervical glands on both sides.

Treatment: Tubercle bacillus vaccine, two weeks, two doses, 0.03 Cc. to 0.05 Cc. Reactions after both doses, slight general, focal in lung only.

Result: Determined seven months later. Left lung normal. Lymph glands not found; no cough; temperature normal; weight, no record; feels well and active. "Apparently recovered."

In going over the foregoing concise records, it will be noted that all the cases reacted to very small doses, which fact is itself diagnostic. Their subsequent improvement and apparent restoration to health can also be considered diagnostic, especially when the administration of the specific remedy was the only treatment applied. The results obtained were as follows:

11 Cases before the Lung Affection had Reached the Open Stage or the Affected Lung Portions were Free from Râles.

Apparently recovered.....	8 cases	72.7 per cent.
Greatly improved.....	3 cases	27.3 per cent.

Complications: One case of pleurisy and

hip-joint disease recovered. Two other cases of pleurisy recovered.

13 Cases in which Destructive Changes, or Localized Râles, were Present in the Pulmonary Lesions.

Apparently recovered	6 cases	46.2 per cent.
Greatly improved	4 cases	30.7 per cent.
Improved	2 cases	15.4 per cent.
Improved but failed on account of other diseases	1 case	7.7 per cent.

Complications: Two cases of pleurisy; both recovered. One case of asthma recovered. One case of thoracic fistula; the discharge was diminished. One case of tuberculous tibia was much improved. One case mixed infection recovered. One case pelvic infection died.

SUMMARY OF RESULTS IN ALL CASES.

Summarizing the results obtained in all the twenty-four cases, taken from the Welfare Department, we have the following:

Apparently recovered	14 cases	58.3 per cent.
Greatly improved	7 cases	29.2 per cent.
Improved	2 cases	8.3 per cent.
Failed	1 case	4.1 per cent.

Body weight: Complete records are present in 21 cases; 20 patients gained 2 to 27 pounds, averaging 9½ pounds; one patient lost in the active period of the disease 24 pounds, and gained thereafter 14 pounds; in three cases there is no record on discontinuing treatment. Enlarged cervical or axillary lymph glands were found in 11 children and three adults; all disappeared, excepting in one case, in which they were reduced in size and number.

Five additional cases were treated with vaccine for a short time, but they discontinued before the result could be determined. They all had severe reactions, which I presume caused them to refuse to report for further treatment. This was known to be the case in a child, aged five, with a tuberculous knee-joint, and in which the focal reactions were particularly severe.

17 CASES FROM PRIVATE PRACTICE.

Case 1.—Mrs. F. N. M., aged thirty-nine. Sister died of tuberculosis ten or twelve years ago. Her own health had declined during last year.

Present condition: Cough with slight expectoration; has lost ten pounds in weight; feels weak and tired; temperature 99.6° to 100° F.; weight 134 pounds.

Physical examination: Slight infiltration in both apices; no râles; left cervical glands palpable.

Treatment: Tubercle bacillus vaccine, six months, twenty-nine doses, 0.05 Cc. to 1.5 Cc. Reactions varied in degree, some mild and some more marked.

Results: Lungs clear; no cough; lymph glands not found; temperature normal; weight 140 pounds, gained 6 pounds. Feels well. Apparently recovered.

Case 2.—Sister L., aged twenty-seven. No family history. Health failed last six months.

Present condition: Cough with slight expectoration; loss of appetite; digestive disturbance; temperature 99.4° to 100° F.; weight 109 pounds.

Physical examination: Slight infiltration apex of left lung; no râles; pleural crepitation at base; left cervical glands enlarged.

Treatment: Tubercle bacillus vaccine, three months, seventeen doses, 0.05 Cc. to 1 Cc. Reactions variable, several of them well marked, general and focal in left apex.

Results: Left lung clear; no cough; no expectoration; cervical glands not found; general health restored; temperature normal; weight 115 pounds, gained 6 pounds. Apparently recovered.

Case 3.—Mr. K. H., aged twenty-seven. Lived with tuberculous grandmother until a year ago. Has declined in health last two months.

Present condition: Cough and slight expectoration; loss of weight; feels tired; temperature 99.4° to 100°; weight 145 pounds.

Physical examination: Slight changes in right apex.

Treatment: Tubercle bacillus vaccine, five weeks, seven doses, 0.1 Cc. to 1.1 Cc.; only slight general and focal reactions.

Results: Lungs clear; no cough; temperature normal; weight 160 pounds, gained 15 pounds. Feels well and strong. "Apparently recovered."

Case 4.—Miss H. H., aged eighteen.

Mother has tuberculosis. Her own health has failed since three months ago.

Present condition: Slight hacking cough; feels tired; has gastric disturbances.

Physical examination: Slight infiltration in right apex and enlarged cervical glands on same side.

Treatment: Tubercle bacillus vaccine, six weeks, four doses, 0.01 Cc. to 0.45 Cc. Reactions mild, except after third dose, which was marked general and focal in lung.

Results: Lung clear; no cough; glands not palpable; no fever; weight 118 pounds, gained 6 pounds. Feels perfectly well. Apparently recovered.

Case 5.—R. S., aged five. Mother had tuberculosis; has not been well for last two years.

Present condition: Slight cough; emaciated; listless; anemic; temperature 99° to 100° F.; weight 35 pounds.

Physcial examination: Slight infiltration right upper lobe; no râles; enlarged cervical and axillary lymph glands on both sides.

Treatment: Tubercle bacillus vaccine, two months, thirteen doses, 0.02 Cc. to 0.6 Cc. Reactions very marked in beginning of treatment; thereafter only mild, permitting rapid increase.

Result: Lungs, no signs; lymph glands all disappeared; temperature normal; weight 45 pounds, gained 10 pounds. Health normal. Apparently recovered.

Note: Has since had influenza; made good recovery.

Case 6.—Miss E. T., aged twenty-three. No history of tuberculosis in family. Declined in health recently.

Present condition: No cough; general malaise; gastric disturbances; temperature 99.2° to 99.5°; weight 150 pounds.

Physical examination: Slight infiltration apex of right lung; no râles; cervical glands enlarged on same side.

Treatment: Tubercle bacillus vaccine, one month, four doses, 0.1 Cc. to 0.5 Cc. Reactions slight general and focal.

Result: Lung, no signs; glands smaller but still palpable; temperature normal; weight 160 pounds, gained 10 pounds. Feels well. Examination one month later: glands palpable, otherwise same. Apparently recovered.

Case 7.—Mr. R. W., aged twenty-six. No family history of tuberculosis. Poor health for last year. Iritis left eye since three months.

Present condition: No cough and no expectoration. Complains of general tired feeling; temperature 99°; weight 140 pounds.

Physical examination: Very slight infiltration apex left lung.

Treatment: Tubercle bacillus vaccine, two months, eleven doses, from 0.05 Cc. to 0.55 Cc. Reactions moderate, in lung, and distinct focal reaction in eye after first three doses.

Result: Lung normal; iritis disappeared;; temperature normal; weight 145 pounds, gained 5 pounds. General health restored; feels perfectly well. Apparently recovered.

Note: Patient is now serving in U. S. Army.

Case 8.—Miss E. W., aged twenty-four. No history of tuberculosis. Has not been in good health for last two years; has been treated for her lung affection for eight months by another physician.

Present condition: Slight cough and expectoration; gastric disturbances; feels tired and exhausted; temperature 99.5° to 100.5°; weight 124 pounds.

Physical examination: Marked infiltration right apex; râles on coughing; left lung, no signs.

Treatment: Tubercle bacillus vaccine, three months, twelve doses, 0.05 Cc. to 0.35 Cc. Reactions general and focal were well marked. Patient discontinued treatment.

Result on discharge not determined. Examination after one year, without further treatment: lungs free from all signs; no cough; general health good; weight 140 pounds, gained 16 pounds. Has since been married. Apparently recovered.

Case 9.—Miss B. W., aged eighteen. Father died of tuberculosis. Has complained for two years. Went to California eighteen months ago, where she improved.

Broke down soon after return, growing worse since.

Present condition: Cough and expectoration; general malaise; loss of appetite and weight; gastric disturbances; temperature 99.5°; weight 112 pounds.

Physical examination: Right upper lobe marked physical signs; no râles. Left lung nothing found. Has enlarged tonsils, bad teeth, tenderness and pain in intestines. Right cervical glands and thyroid gland enlarged. Rapid pulse.

Treatment: Tubercle bacillus vaccine, one month, three doses, 0.05 Cc. to 0.15 Cc. Severe general and focal reactions after each dose. Patient discontinued treatment on account of reactions.

Result: Examination one month later. Lung infiltration less marked. Tonsils, thyroid and cervical glands, no change. Temperature normal. Weight 120 pounds, gained 8 pounds. "Improved."

Case 10.—Mrs. B. W., aged twenty-eight. No history of tuberculosis. Has been losing in health for last year.

Present condition: Slight cough; general malaise; gastric disturbances; temperature 99° to 100°; weight 117 pounds.

Physical examination: Slight infiltration left apex; pleurisy at base. Right lung, no signs. Left cervical and axillary glands enlarged.

Treatment: Tubercle bacillus vaccine, two months, 0.05 Cc. to 0.5 Cc. Reactions more or less marked general and focal.

Result: On dismissal, improved. On examination, four months later, lungs clear; no signs of pleurisy; cervical glands not palpable; temperature normal; weight 136 pounds; feels well. Apparently recovered.

Case 11.—Mrs. N. W., aged forty-six. Father died of tuberculosis twenty years ago. Has had lung trouble for the last six years.

Present condition: Cough and expectoration; complains of loss of appetite; gradual loss of weight; feels weak and tired; temperature 99° to 100° F. Weight 121 pounds.

Physical examination: Marked physical signs in right upper lobe; fine crackling râles; signs of cavity. Left lung, no signs; cervical glands right side enlarged.

Treatment: Tubercle bacillus vaccine, 3½ months, twenty doses, 0.08 Cc. to 1.4 Cc. Reactions to first five doses marked, general and focal; slight reactions thereafter, permitting rapid increase of doses.

Results: Physical signs in lung disappeared. Lymph glands not palpable. Temperature normal. Weight 135 pounds, gained 14 pounds. Feels entirely well. Apparently recovered.

Note: Recent examination shows same condition.

Case 12.—Mrs. G. R., aged thirty-one. No tuberculosis history. Health declined since childbirth two years ago.

Present condition: Slight cough and expectoration; loss of appetite and weight; general malaise; anemic; temperature from 99° to 100°; weight 108 pounds.

Physical examination: Right apex, slight infiltration; no râles. No signs on left side.

Treatment: Tubercle bacillus vaccine, four months, twenty-two doses, from 0.05 Cc. to 1 Cc. Reactions moderate throughout.

Result: Lungs clear. Temperature normal; weight 120 pounds, gained 12 pounds. Feels well. Apparently recovered.

Case 13.—Mrs. G. W., aged nineteen. Sister has tuberculosis. Last three months health is failing; has lost weight.

Present condition: Cough and expectoration; general malaise; temperature 100°; weight 110 pounds.

Physical examination: Marked infiltration of right apex, with moist râles; pleurisy right lower lobe. Slight infiltration of left apex—no râles.

Treatment: Tubercle bacillus vaccine, four months, nine doses, 0.12 Cc. to 1.4 Cc. Severe reaction to first dose both general and focal; subsequent reactions mild.

Result: Lungs, no physical signs; signs of pleurisy also disappeared; no cough or expectoration; temperature normal; weight 120 pounds, gained 10 pounds. General health restored. Apparently recovered.

Case 14.—Miss P. B., aged sixteen. Tuberculous family. Health declined since one year ago.

Present condition: Cough and expectoration; hoarseness; temperature 100°; weight 100 pounds.

Physical examination: Right upper lobe, marked infiltration; destructive area in apex with râles. Left apex, slight infiltration. Larynx, cords and posterior walls infiltrated and swollen.

Treatment: Tubercle bacillus vaccine, one month, five doses, 0.05 Cc. to 0.1 Cc. Reactions general and focal, including larynx.

Result: On dismissal slightly improved. Examination three months later: temperature normal; weight 110 pounds, gained 10 pounds. Larynx normal; lungs improved. Greatly improved.

Case 15.—Miss E. H., aged thirty-three. No history of tuberculosis; has been in indifferent health for eight years, failing more markedly for the last three months.

Present condition: Dry cough; general malaise; anemic; loss of appetite and weight.

Physical examination: Slight infiltration apex of right lung.

Treatment: Tubercle bacillus vaccine, six months, twenty-four doses, 0.05 Cc. to 1.5 Cc. Reactions moderate general and focal.

Result: Physical signs disappeared. Temperature normal; weight 95 pounds, gained 6 pounds. Apparently recovered.

Case 16.—Miss C. K., aged thirty-three. Family history of tuberculosis. Has been complaining for fifteen years. More decided decline in health last three months.

Present condition: Cough and expectoration; feels tired; temperature 99° to 100°; weight 100 pounds.

Physical examination: Marked infiltration and râles in left apex; infiltrated area in right apex; no râles.

Treatment: Tubercle bacillus vaccine, two months, fourteen doses, 0.05 Cc. to 0.5 Cc. Reactions severe, general and focal, to all doses.

Result: Examined three months later. Lungs, no physical signs; no cough or expectoration; temperature normal; weight 110 pounds, gained 10 pounds; feels well. Apparently recovered.

Case 17.—Mr. M. A. C., aged twenty-nine. Sister has had tuberculosis. Lost weight for last year.

Present condition: Dry cough; has lost in weight and strength.

Physical examination: Slight infiltration in right apex; right epididymis enlarged; temperature 99.5°; weight 131 pounds.

Treatment: Tubercle bacillus vaccine, two months, fourteen doses, 0.05 Cc. to 1 Cc. Reactions moderate general and focal, including epididymis.

Result: Examination three months later: no signs in lung; temperature normal; weight 145 pounds, gained 14 pounds. Testicle normal. General health good. Apparently recovered.

Note: See experimental studies, group 2, guinea-pig No. 3350.

Summary of Results.

13 early stage cases; apparently recovered	13	100 per cent.
4 advanced stage cases; apparently recovered	2	50 per cent.
greatly improved	1	25 per cent.
improved	1	25 per cent.

Body weight: All 17 patients gained weight, varying from 5 to 19 pounds, the average gain being 11 pounds.

Complications: Pleurisy occurred in two patients and both recovered. Larynx tuberculosis was present in one patient, which was greatly improved; only slight thickening of posterior wall remained. Tuberculous epididymitis in one case; some thickening remaining. One case tuberculous iritis recovered after the third dose. Lymph glands were enlarged in eight cases; all disappeared.

In considering both the series of cases I wish to call attention to the entire disappearance of bronchial asthma in case number 10 of the Welfare Series, no remedies other than tubercle bacillus vaccine having been applied; and to case number 7 among private patients, in which a troublesome iritis reacted to the vaccine and disappeared after the third dose.

It will be noted that the general and focal reactions were well marked or severe in most of the cases of the present reports. In

regard thereto I may say that such reactions can be avoided if this is desired, by beginning the specific treatment with still smaller doses and by increasing them slowly and only after the previous dose has caused no reaction at all. This, however, means to also prolong the period of treatment. I have seen no harm; on the contrary, there was always most decided improvement of the tuberculous lesions after the subsidence of marked focal reactions.

EXPERIMENTAL STUDIES.

My clinical results from watery extract of tubercle bacilli, and more recently from vaccine against tuberculosis, which I reported to you at our meeting two years ago, and again in the present paper, having proved highly satisfactory, caused me to devote myself to the study of specific medication in tuberculosis with constantly increasing interest. I find that my results are equally favorable with those obtained by other observers—Taylor (2); Julian (3); Robinson (4); Terrill (5); Watterson (6); Flack (7); Terry (8)—who have used the same preparations. And I find likewise that the results of theirs, as in my own cases, were not materially at variance from those obtained and reported by the Doctors von Ruck in their numerous reports from the Winyah Sanatorium at Asheville, N. C., especially in the comparatively earlier and non-complicated phases of pulmonary tuberculosis, in which sanatorium management is perhaps not so essential as it is in the more active or advanced stages of tuberculous disease.

Under these circumstances my interest extended likewise to the experimental data, which are recorded in Section 111 of the recent work by the Doctors von Ruck (9). I therefore approached Dr. Karl von Ruck, with the request to make it possible for me to conduct similar animal experiments personally and without the necessity of giving enough of my time to do so in his laboratory in Asheville.

To this request Dr. von Ruck acceded most readily, conditioning, however, that the immunity test and infections be made under his personal observation. The animals themselves remained under my control and were removed immediately from his laboratory after the infections were made. The course of the infections was thereafter observed by Dr. N. D. Goodhue, of this city, and by myself. Dr. von Ruck likewise pointed out that the experimental infections must be made with a definite quantity of tubercle bacilli; that the virulence of the infections must be just enough to cause tuberculosis and no more.

Two series of experiments were then made. The first failed in the sense that the infections were not virulent enough to cause tuberculosis in either the controls or the principals in the time the animals were allowed to live. The second series proved, however, more successful in that none of the principals showed an infection, whereas with three exceptions the controls all presented tuberculosis in various stages of evolution at the time when they were killed and autopsied.

Dr. Goodhue was kind enough to supervise with me these experimental details by going to Asheville to observe the sera test and to infect the animals; to take charge of them and to make the autopsies and histological examinations of the lesions found. We are both aware that it would have been better had the period of observation been longer, but pneumonia appeared among the animals with increasing frequency, and we terminated the experiments on that account.

The culture used for infection was of human origin, and the emulsion of the bacilli was prepared by Dr. Hazelwood, of Dr. von Ruck's laboratory, and it was stated to Dr. Goodhue and myself that it contained 0.2 milligramme of tubercle bacilli per cubic centimeter and that 0.2 cubic centimeter of such an emulsion from the same culture had proved virulent and caused tuberculosis in guinea-pigs upon a previous trial. Tubercle bacilli were demonstrated in the emulsion by microscopic examination before and after the infections were made. All animals were fully described, weighed, and identified; all were infected subcutaneously in like manner, the principals in the right and the controls in the left axilla.

There were two groups: the first active immunization, in order to demonstrate the value of the vaccine for this purpose; the second group was to demonstrate the bactericidal action of the blood serum of persons immunized with the same vaccine. The sera of all principals showed positive results in complement fixation tests, as observed by Dr. Goodhue and myself.

Each of the doses of tubercle bacilli (0.2 Cc. of T. B. emulsion) used for the bactericidal tests was placed in a properly marked test tube, and 0.2 Cc. of the serum was added and incubated for twenty-four hours at 98° to 99° F. The content of each tube was then used for the infections.

First Group.

Eight guinea-pigs treated with vaccine. Eight normal guinea-pigs used as controls. (All infected alike on June 5, 1918, with 0.2 Cc. tubercle bacillus emulsion.)

Guinea-pig number.	Dose of vaccine.	Amount vaccine used.	Died or killed. Days after infection.	Result of autopsy.
3211	10	6.4 Cc.	Killed 70 days.	No tuberculosis (normal).
3212	11	7.5 Cc.	Killed 112 days.	No tuberculosis (normal).
3213	11	5 8 Cc.	Died 92 days.	No tuberculosis (pneumonia).
3214	10	5.5 Cc.	Died 107 days.	No tuberculosis (pneumonia).
3215	10	5.5 Cc.	Killed 112 days.	No tuberculosis (normal).
3239	10	10.0 Cc.	Killed 112 days.	No tuberculosis (pneumonia).
3240	10	5.5 Cc.	Killed 112 days.	No tuberculosis (normal).
3241	10	8.5 Cc.	Killed 112 days.	No tuberculosis (normal).
Controls:				
3358	No treatment.		Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3359	No treatment.		Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3360	No treatment.		Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3361	No treatment.		Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3362	No treatment.		Killed 112 days.	Lymph gland tuberculosis, only.
3363	No treatment.		Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3364	No treatment.		Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3365	No treatment.		Killed 92 days.	Lymph gland tuberculosis, extension to internal organs.

Second Group.

Eight guinea-pigs and eight controls infected on June 5, 1918, with the content of a tube containing 0.2 Cc. each of Tubercle Bacillus Emulsion and 0.2 Cc. of immune serum or normal serum.

Guinea-pig number.	Immune serum taken from:	Died or killed. Days after infection.	Autopsy or cause of death.
3350	Discharged patient.	Killed 112 days.	No tuberculosis (normal).
3351	Patient under treatment.	Died 7 days.	No tuberculosis (enteritis).
3352	Patient on discharge.	Killed 112 days.	No tuberculosis (normal).
3253	Patient on discharge.	Killed 112 days.	No tuberculosis (normal).
3254	Patient under treatment.	Killed 112 days.	No tuberculosis (normal).
3255	Child vaccinated six months before.	Killed 112 days.	No tuberculosis (normal).
3256	Child vaccinated six months before.	Killed 112 days.	No tuberculosis (normal).
3257	Child vaccinated six months before.	Died 70 days.	No tuberculosis (pneumonia).
Controls:			
3266	Normal salt control.	Killed 112 days.	No tuberculosis.
3267	Normal salt control.	Killed 112 days.	No tuberculosis.
3268	Normal salt control.	Killed 112 days.	No tuberculosis.
3269	Normal person.	Killed 112 days.	Lymph gland tuberculosis only.
3270	Normal person.	Killed 70 days.	Lymph gland tuberculosis, extension to internal organs.
3271	Normal person.	Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3272	Normal person.	Killed 112 days.	Lymph gland tuberculosis, extension to internal organs.
3273	Patient before treatment.	Killed 112 days.	Lymph gland tuberculosis only.

From this tabulation it may be observed that in neither Group 1 nor 2 did the principals show that the infection caused tuberculosis, and that all controls in Group 1 had acquired tuberculosis; in seven of the eight controls the disease had extended to internal organs.

In the controls of Group 2 the infection failed to show macroscopic tuberculous lesions in three animals in which the normal serum had been substituted by normal salt solution, for which we have no adequate explanation, unless that perhaps the animals were killed too soon. The five serum controls were tuberculous, and in three of them the disease had become generalized, having extended to internal organs.

The importance of these animal experiments is, however, secondary to the results obtained in human subjects. They show that animals can be protected against a mild infection with living tubercle bacilli by the administration of a suitable specific vaccine, and that active serum, taken from human subjects after treatment, or after prophylactic vaccination, with the same vaccine, acquires a higher degree of germicidal action upon living tubercle bacilli than is present in normal or tuberculous persons.

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FUNCTIONAL AND ORGANIC BLOOD-PRESSURE.

BY H. H. ROBERTS, M.D., WHITE SULPHUR SPRINGS, W. VA.

For many years the prevailing opinion with investigators and research workers regarding blood-pressure was that it was a condition incident to those individuals past middle life, and considered a condition of disease peculiar to old age.

More advanced work discloses the fact that high blood-pressure or low blood-pressure is a condition which may affect individuals at all ages and under various circumstances of life.

Change in pressure may be brought about at different times of the day. The tension may be influenced by the mental attitude, or the kind of diet; sudden anger or emotion will cause a marked change in the blood-pressure. Intense hilariousness or mental depression will affect the tension; strenuous exercise or rest will have an influence on the tension of the arterial walls, readily making a differential diagnosis between a functional and an organic blood-pressure.

The normal blood-pressure depends upon the vasomotor system, the strength and energy of the heart, the elasticity of the walls of the vascular system, the volume of blood circulating, and the peripheral resistance.

Anything which will break the harmony of this mechanism will alter the blood-pressure.

Arterial tension is a symptom and not a disease, and as a symptom is one of the most important in the study of disease, for by the blood-pressure we are enabled in many conditions not only to make a correct diagnosis, but also a correct prognosis.

The changes in blood-pressure during the recent epidemic of influenza have been noted with much interest.

Doubtless this is due to the toxemia producing shock to the system. So marked has been the evidence of the toxic shock that very low pressures have continued for several weeks after the patient had apparently recovered from the attack.

The leukopenia present in many cases is the result of the profound toxic condition, and this condition with the extremely low pressure points to a bad prognosis.

The lowered vital resistance and low pressure after recovery is doubtless the cause of so many serious and fatal complications following influenza.

The treatment of many diseases and conditions may be largely governed by the variation in blood-pressure.

In the study of blood-pressure the diastolic tension is the most important. The diastolic shows the peripheral resistance in the arterial system, and the difference between the systolic and the diastolic is the pulse pressure, which will indicate the work the heart is undergoing in maintaining the circulation.

The pulse pressure becomes of great value in indicating the patient's true condition. Marked variation in the pulse pressure

will be of considerable assistance in differential diagnosis between a functional and an organic lesion.

The diastolic pressure indicating the peripheral resistance will give a better knowledge of the true hypertension than the reading of the systolic pressure.

If greater care were maintained in the correct interpretation of the diastolic pressure, vasodilators would not be employed so frequently as they are now to lower the systolic pressure.

In a normal individual the blood-pressure may be increased as much as 30 mm. above the normal without any apparent pathological change.

To correctly estimate the blood-pressure in an individual, the measurement should be taken a number of times—after exercise, after meals, and after rest.

If there is a question as to whether the hypertension is functional or organic, the patient should be put to bed and all food, except milk, restricted for eighteen to twenty-four hours, the blood-pressure being carefully noted before and after the rest.

If the condition present is functional, the fall in tension will indicate the normal, while if organic there will be but little, if any, change in the blood tension.

After it has been determined that the patient has a pathological blood-pressure, careful investigation should be made to ascertain the cause. Much will depend upon the experience of the physician in locating the cause.

With a continued systolic pressure of over 200 mm. we are justified in suspecting some form of nephritis. If the systolic tension is high and is accompanied by a low diastolic pressure, we may suspect an aortic regurgitation.

If after repeated examinations there is shown a continued low tension without any other clinical symptoms, we are justified in suspecting a latent tuberculosis.

The use of the sphygmomanometer should be a routine in every examination, for by its use there are frequently revealed conditions which but for such an examination would not be suspected until serious and perhaps dangerous results had been established.

In many cases of neurasthenia and some of the psychoses, by correcting a functional low or high blood-pressure, splendid results follow.

In pneumonia the tension becomes of very great importance when compared with the pulse-rate.

If the pressure is kept above the pulse-rate the condition is favorable for the patient's recovery. However, if the tension is going down and the pulse is going up, there is necessity for immediate action, if the patient is to be saved.

Death in pneumonia is probably due to the toxic paralysis of the vasoconstrictor center resulting in vascular stasis. The state of the blood tension is the vital issue.

Much valuable information is afforded by the measurement of the blood tension in heart cases.

There is frequently a high pressure and enlarged heart without any valvular disease or endocardial murmur.

There are indications of a poor circulation when with a high systolic tension the diastolic tension is relatively low.

In aortic regurgitation there is present a systolic hypertension with a low diastolic pressure.

In chronic myocarditis, the blood tension will indicate this disease before there are any other symptoms present. The careful watching of the tension in myocarditis is of greater value than in any other of the cardiovascular diseases. The more extensive the change in the heart muscle the greater will be the pulse pressure.

In persistent dull pain in the abdomen, the measurement of the blood tension will indicate that there is present arteriosclerotic condition of the abdominal arteries.

In functional high blood-pressure from intestinal toxemia, the thorough cleansing of the intestines by repeated doses of castor oil will produce most happy results.

The care of patients with either hypertension or those with hypotension will depend upon the condition and the cause. Each case requires select treatment for the

individual. The success of the treatment will be governed by the accuracy of the diagnosis.

Few, if any, of these cases do well under medication. Selective hydrotherapy with a systematic course of exercises and a well-regulated diet have given satisfactory results.

At the spas combined hydrotherapy and the high-frequency current have given the best results in the organic cases.

The removal of the cause is the cure for the functional cases.

The sedative scenic environments of the mountains and freedom from care and worry are productive of the best results, for we must not lose sight of the fact that blood-pressure is not only a symptom, but also that it is very materially influenced by the mental attitude of the patient.

The ever strenuous business life and the nervous tension under which the people have lived for the past year has produced a functional condition of hypertonicity which should not be confused with organic changes. This condition of hypertonicity is readily corrected with the sedative influence to be acquired at some well-equipped spa or health resort, preferably in the open country or mountain retreats.

REMOVAL OF TONSILS AND ADENOIDS UNDER LOCAL ANESTHESIA.[1]

BY FIELDING O. LEWIS, M.D.,
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In presenting this subject of local anesthesia in tonsillectomy the remarks and conclusions are based on some four hundred adult cases.

In selected adult cases the value of local anesthesia over general anesthesia is briefly that: (1) There is less danger of starting up an old tuberculous lesion of the lungs, which is so frequent where general anesthesia is universally employed. (2) General anesthetics have been known to produce nephritis, cardiac and respiratory failure, and insufflation pneumonia. (3) No cases of abscess of the lung have been reported following tonsillectomy under local anesthesia. Several, however, have been reported where general anesthesia has been employed, no doubt caused by insufflation of the blood or infective secretions. (4) It is available when general anesthesia is contraindicated, as chronic nephritis, respiratory disorders, pulmonary tuberculosis, etc. (5) The rapidity with which the operation may be done without the shock which follows a general anesthetic. (6) When the case is uncomplicated it is a time-saver, and requires fewer assistants and less material.

I have found local anesthesia unsatisfactory in children under ten or twelve years of age, since it is hard to make them understand just what is going to be done. When it is attempted in children it usually resembles a fight more than an operation, consequently there is grave danger of mutilating the surrounding tissues. It is I believe contraindicated in secondary operations, because of the great amount of scar tissue, which requires often a long dissection. The same is true with those who have had repeated attacks of peritonsillar abscess. Local anesthesia is not entirely satisfactory in highly neurotic patients, and those with extremely sensitive throats.

Among the solutions which may be employed as local anesthetics in tonsillectomies are cocaine 1/10 of 1 per cent to ½ of 1 per cent, novocaine ½ to 1 per cent, apothesine 1 to 2 per cent, quinine and urea hydrochloride 1 per cent. In camp, where I was located during my services in the army, and where all cases of tonsillectomy were done under local anesthesia, I have seen employed with fair success a 1-per-

[1]Read before The Section of Otology and Laryngology at the College of Physicians, February 19, 1919.

cent solution of quinine sulphate and even a weak solution of Epsom salts. Personally I prefer using a 1-per-cent solution of apothesine or ½ of 1 per cent novocaine to which is added 1 drop of adrenalin chloride solution 1 to 1000 to each fluidrachm of the anesthetic.

Many failures attributed to local anesthesia in tonsillectomy I believe are due to faulty technique in its application. We must bear in mind that the tonsil is supplied by a circular plexus of nerves from the middle and posterior branches of the sphenopalatine nerve, joining with branches of the glossopharyngeal nerve, which have their entrance through and around the capsule of the tonsil. In order to get complete anesthesia the anesthetic must be introduced between the capsule and the muscle. The tonsil and pharyngeal mucous membrane are first painted over with a 10-per-cent solution of cocaine. A long, sharp, straight needle is attached to the hypodermic syringe and plunged through the tonsil in two or three places, and about one drachm of the solution is injected between the capsule and the muscle of each tonsil, or more if the tonsil is extremely large. I find it necessary in some cases to inject a small amount of the solution between the anterior pillar and the tonsil above and below. In highly neurotic or nervous patients I sometimes administer ¼ of a grain of morphine, with 1/150 of atropine, one hour before the operation. I believe, however, that this is a bad practice in all cases, as the patient usually subsides into a profound narcotic sleep following the operation; and should postoperative hemorrhage occur it might prove rather alarming.

Five or ten minutes following the injection of the anesthetic the tonsil is grasped with the tenaculum forceps and an inverted U-shaped incision is made around the tonsil (avoiding the pillars) with a sharp short-bladed knife. A snare is then placed in position, and by gradual traction on the tenaculum forceps, at the same time slight pressure being made against the anterior and posterior pillars with the snare loop, the tonsil is everted. It is then quickly snapped off. This requires but a few seconds.

Following the removal of the tonsil it has been my custom, where the tonsillar fossa is of sufficient size, to insert a small gauze sponge, which is left in position for four or five hours following the operation. This I am convinced helps to prevent the possibility of postoperative hemorrhage.

In my early experience postoperative hemorrhage occurred more frequently under local anesthesia and was more difficult to control, after the effects of the local anesthetic had worn off. Recently, however, I have practiced crushing, by means of a suitable hemostat, all areas that are inclined to bleed.

The period of convalescence is usually longer under local anesthesia, and the patient apparently suffers more postoperative pain than under general anesthesia.

In those cases in which it is necessary to remove a portion of the lingual tonsil it is not so easy to render insensitive to pain the tissues at the base of the tongue.

Local anesthesia is not without its dangers. An embolus might be introduced into the blood stream by the use of the hypodermic needle, or the solution injected into the circulation through an anomalous vein. There have been some cases of death reported by local infections at the seat of operation. In my own experience I have had some very uncomfortable moments, in the early days when stronger solutions were used and stronger doses of adrenalin chloride given. Some two years ago, while using 1-per-cent solution of novocaine and adrenalin chloride on one of the internes at the Philadelphia General Hospital (a young, robust man), I was very much alarmed to see the patient collapse immediately following the injection of the anesthetic, attended with paralysis of the right side of his body and aphasia, which lasted for six hours. It is needless to say that I did not remove the tonsils. Looking for the cause of these untoward symptoms I was informed that he had a history of being extremely neurotic. I have had no deaths,

and in a few cases a general anesthetic was administered in order to control postoperative hemorrhage.

Adenoidectomy, under local anesthesia, is very easily performed by retracting the velum and injecting into the adenoid mass the same solution as is used in the tonsil operation, then removing the adenoids by inserting a La Force adenotome equipped with a sharp blade.

TREATMENT OF SEVERE AND PROGRESSIVE HEMORRHAGE BY INTRAVENOUS INJECTIONS.

PENFIELD, in the *American Journal of Physiology* for February, 1919, concludes that the blood-pressure of experimental animals was kept at a shock level for various lengths of time by progressive bleeding, so that their condition resembled that which must frequently exist in wounded men at the front who have sustained severe and continued loss of blood. After analyzing the condition of these experimental animals according to the duration of low blood-pressure, the amount of blood lost, and the degree of acidosis resulting, he has not been able to show that gum-sodium bicarbonate solution or gum-glucose solution is more efficacious in saving life than is an isotonic solution of sodium chloride.

By perfusing an isolated vascular bed it has been shown that following a large hemorrhage there is a primary constriction of the peripheral vessels. With continued low blood-pressure this constriction passes off and dilatation supervenes. Associated with the dilatation the venous pressure rises while the arterial pressure is falling. All dogs in which the venous pressure rose while the arterial pressure was falling, for a period of twenty minutes or more, died regardless of treatment.

The effects of stimulation of the saphenous nerve while these animals were in a condition of profound shock indicated that the reflexes affecting respiration and blood-pressure were not paralyzed, although this point deserves to be given more careful consideration.

INJURIES AT BIRTH: THEIR EFFECT UPON THE CHILD AND THEIR PREVENTION.

HIRST, in the *New York State Journal of Medicine* for February, 1919, states that the prevention of these injuries must be the result of a better education in obstetrics than former generations of medical students have had in America.

The indications for Cæsarian section, the technique of abdominal surgery, the limitations of and the indications for the minor obstetrical operations, the proper time and the indications for premature labor, pelvimetry and antepartum fetometry, must all be taught not only theoretically but by sufficient practical drill. The rosters of our medical schools must be constructed on modern pedagogical principles and not in accord with the absurd allotment of time prescribed by the committee on medical education of the A. M. A., which calls for much the smallest amount of practical training demanded by any civilized country. When these reforms are accomplished it will be found that injuries to the child at birth have become rare; in fact, they should almost disappear.

As to the effect of these birth injuries upon the child it may be summed up in a single sentence, death or a disability often making death preferable.

If Snow's statistics, based on almost a million and a half births, are correct, 250,000 infants are lost annually in the United States in the first four weeks of life. If there are 2,500,000 births annually in our hundred million population there have been at least a half million abortions. In other words, there is a loss to our population, largely preventable, of three-quarters of a million every year. This is a fearful wastage of human life that could be enormously reduced by prenatal care and the proper management of labor. There is scarcely another medical question comparable with this in its economic and humanitarian importance, especially at this time of reckless slaughter of the youth of so many lands. It behooves our medical teachers and our lawmakers to give it adequate attention.

EDITORIAL.

IPECAC VERSUS EMETINE IN THE TREATMENT OF AMEBIC DYSENTERY.

As our readers well know, ipecac was regarded more or less as a specific in certain types of dysentery decades before it was recognized that the ameba was the causative agent. The heroic doses of ipecac which were required to produce a cure, when considered in association with the grave condition of prostration often presented by the patient, did much to stay the physician's hand in employing adequate amounts, and the frequent necessity of administering opiates in full doses in order that the ipecac would not be vomited also tended to make the treatment more or less unpopular.

Our readers will also remember that largely through the investigations of Vedder in this country and Rogers of Calcutta, emetine sprang into great popularity when administered hypodermically in treating amebic dysentery, since it obviated the employment of opiates and doses of ipecac so large as to induce vomiting. These investigators showed that a certain proportion of cases could be cured by this method of treatment.

It was not long, however, before it was found that while full doses of emetine were therapeutically effective, they were prone to produce circulatory depression, and a number of cases of death have seemingly occurred as the result of the hypodermic use of large quantities of emetine due to its effect upon the heart. Further experience has also indicated that the therapeutic value of emetine when given hypodermically is more limited than the therapeutic value of ipecac.

A number of years ago Vedder admitted that a considerable number of cases treated in this way continued to harbor the ameba of dysentery in its encysted form, so that the patient was apparently, rather than truly, cured, and certainly continued to be a carrier and distributor of the disease.

Other clinicians have also seemed to show that while active amebæ are killed by the use of emetine hypodermically, the drug has no effect upon the cystic forms. Indeed some clinicians seem to regard emetine used in this way as palliative rather than as a true remedy, and point out that relapses often occur when it is relied upon, whereas when ipecac is given in proper doses by the mouth, permanent recovery ensues.

It would seem that in a certain proportion of cases in which the patient is so exhausted that the ipecac seems contraindicated, the disease should be gotten under control by the use of emetine given hypodermically, and then when the patient has been built up the final cure should be induced by full doses of ipecac which has been proved beyond all doubt to be efficacious.

Those who advocate the use of ipecac claim that as much as seventy-five grains a day may be given for a week or ten days without producing toxic effects.

The next question which arises is as to the alkaloidal content of ipecac and which alkaloid is therapeutically efficient. There seems to be no doubt that emetine is a cardiac depressant and a gastrointestinal irritant even when given hypodermically. Sometimes it produces peripheral neuritis, but more often cardiac arrhythmia. On the other hand, cephæline, the other alkaloid, which closely resembles emetine in some respects, seems to be as active as is emetine in destroying the amebæ, although it is not yet proved that it is more efficacious in destroying the cystic forms.

Efforts have been made to obtain from emetine, and cephæline, synthetic substances which would produce all their advantages with none of their disadvantages.

But the point which is of chief interest would seem to be that we have traveled somewhat in a circle and are coming back to the original method of treatment as being the only efficacious one, particularly if the ipecac is given in pills which are coated

in such a way that they escape into the intestine before being dissolved in the stomach. Thus we find that those who employed ipecac in the tropics, without knowing the cause of dysentery, followed the method which seems to be generally regarded at the present day as the best and insisted that every detail should be carried out. The first of these was that the patient must go to bed throughout the entire course of treatment, or for a period of ten days or two weeks, and second, that articles of food which leave practically no residue in the intestines should be used; in other words, that broths, albumin water and similar substances should be employed; even milk being added only at the end of a week. Prior to the administration of the ipecac a dose of castor oil should be given, and twelve hours later 10 to 15 salol-coated pills should be taken, each of which contains five grains of powdered ipecac, the pills being washed down with a moderate amount of water, and no food being allowed for two hours before or six hours after the pills are swallowed.

If the patient is much depressed it may be necessary to give the pills every other day instead of every day. In certain cases in which the ipecac produces vomiting it would be well to introduce it into the intestine by means of the duodenal intubation tube. This pill method carries a greater quantity of the alkaloids of ipecac into the intestine than can be given safely by hypodermic injection, and it is claimed by Simon, in a paper which he has recently contributed to the *Journal of the American Medical Association*, that the entire ipecac root when employed under proper conditions not only destroys the active amebæ but the encysted forms as well, thereby preventing recurrences or relapses of the infection and cleaning up carriers of the disease.

Those of our readers who are particularly interested in this subject will find much of value not only in Simon's paper, but in the discussion which followed it, which appears in the journal quoted for December 21, 1918.

AUTOSEROTHERAPY IN PLEURAL EFFUSION.

Readers of the THERAPEUTIC GAZETTE will remember that on several occasions we have called attention to autoserotherapy in the treatment of pleural effusion. It is a method which has been very popular with French physicians for a considerable number of years, and we have used it for a long time. We learned many years ago that the introduction of a sterile needle through the chest wall, even if only a small quantity of fluid was abstracted, frequently resulted in the speedy absorption of that which remained.

Autoserotherapy when carried out *secundum artem* consists, of course, in introducing a needle into the fluid, drawing some serum into a syringe, withdrawing the needle until its point is in the chest wall, then changing its direction slightly and injecting a small quantity of the pleural effusion into the tissues forming the wall of the chest, the theory being that in this manner some ferment, or autolytic substance, is provided which instigates absorption. As performed by us many years ago this result probably accrued through leaving in the track of the needle a minute quantity of the fluid.

Of course this method is of no value where pus is present. Thoracic puncture is, however, not limited, in our opinion, to pleural effusion alone. Very frequently in cases of delayed resolution in pneumonia the introduction of a needle into the consolidated area results in speedy absorption, possibly because puncturing the visceral layer of the pleura relieves pressure or because some ferment is carried by the needle from the wall of the chest into the lung.

We confess that we stumbled over this fact many years ago when endeavoring to tap what was supposed to be a pleural effusion only to get a dry tap. However, humiliation at the dry tap was soon changed into rejoicing at speedy resolution.

The writer of this note has never seen evil after-results follow even when the

error has been made of mistaking an interlobar empyema for delayed resolution. While such a puncture has no therapeutic value in interlobar empyema, nevertheless the appearance of pus in the syringe at least makes the diagnosis clear, and points to what should be done.

An interesting paper upon the value of autoserotherapy in tuberculous pleurisy was contributed by Lyter to the *American Journal of the Medical Sciences* for November, 1918. Lyter quotes a good deal of the literature on the subject and states that in his series of cases there were eight absorptions occurring out of 23 patients, or 34 per cent, whereas some of the other investigators report a much higher percentage, namely 80. Lyter is not, therefore, as enthusiastic about this method as Fishberg and some of the French writers, but it is evident that in a certain proportion of cases it possesses distinct therapeutic value.

FURTHER STATEMENTS WITH REGARD TO THE TREATMENT OF MALARIA.

Readers of the THERAPEUTIC GAZETTE will recall that during the past two years we have printed a number of leading articles dealing with the employment of quinine and its derivatives in the treatment of malarial infections. We have also discussed the best salts and best methods of administration, pointing out that some practitioners were heartily in favor of intramuscular injections and that others were bitterly opposed to them and considered them dangerous because of local inflammation, and in India, because of the occurrence of tetanus.

Although the subject has been so thoroughly considered, nevertheless it is not out of place to quote from a recent communication made to the *British Medical Journal* by Sir Leonard Rogers, Professor of Pathology in the University of Calcutta, whose contributions on the treatment of cholera and amebic dysentery have made his name known everywhere throughout the English-speaking world. On one occasion, not long since, he made a valuable contribution to the THERAPEUTIC GAZETTE.

In the paper to which we have just referred he points out that medical men practicing in highly malarious countries find that severe plasmodial infections constitute an important cause of death. The recognition of this fact is important, because he believes the disease and its result, death, to be entirely preventable by early recognition and active treatment, although he admits that in most severe infections quinine may be powerless to avert a fatal issue. For this reason he has already discussed in an earlier paper the suitability of soluble salts of quinine and cinchonine for intravenous injections, having for a long time advocated the intravenous injections of soluble quinine salts in such dangerous cases, with preference for the hydrobromide of quinine, believing it to be less toxic than the others. He claims that a number of East Indian physicians following his methods have confirmed his conclusions and admits that the difficulties of intravenous injection, when medical men are few and far between, are not to be ignored. He also states that if the injections are given too fast in doses of 10 or 15 grains of the drug, sudden death may occur, a conclusion which we arrived at many years ago. Quinine injected directly into the jugular vein will kill a large dog more quickly than chloroform.

The burden of the present communication of Sir Leonard's is, however, to recommend the use of the cinchonine salts in preference to quinine, since when they are given intramuscularly or subcutaneously they seem to be rapidly absorbed without causing the pain that quinine usually causes. That they are rapidly absorbed is shown by the early appearance of the alkaloid in the urine and by the evidences of cinchonism.

Another advantage he thinks is that while quinine is precipitated in the muscle, the same degree of precipitation does not occur with the cinchonine salts. Carefully

arranged details of his investigations may be found in his original paper.

The conclusions which Rogers arrives at are that cinchonine bihydrochloride in a 1-in-2 solution, carefully sterilized in an autoclave, is so rapidly absorbed as to be almost as quick in its action in severe malaria as quinine or cinchonine salts given intravenously, without the inconvenience and possible dangers of intravenous injections, although he still believes that in very urgent cases of severe infection the intravenous method is the only one to be followed. This use of cinchonine bihydrochloride is particularly advantageous in those whose stomachs will not tolerate full doses of quinine. He recommends from 7 to 15 grains each day, particularly in the early stages, to rapidly control the fever and the infection, and then, if it is desired, quinine may be administered by the mouth according to the usual methods.

We have called attention on previous occasions to the danger of developing strains of immune parasites by the use of small prophylactic doses of quinine. It has been recognized for years that these prophylactic doses often prevent malarial manifestations until they are stopped. When the disease develops it is difficult to cure, but that it can be temporarily arrested, or in some cases prevented, by prophylactic doses is well known. On the other hand many observers claim that even for ordinary prophylaxis quinine is useless. Scott, who lives in the Federated Malay States, reports in the same issue of the *British Medical Journal* upon the prophylactic administration of quinine to a large number of natives engaged in collecting from rubber trees. Taking 140 men who performed one kind of work known as tapping and 252 who were weeders, he gave quinine to the tappers, who were much more exposed, with an incidence of 14.31 per cent per month, whereas the weeders, who were less exposed and had received no quinine during the entire year, had an incidence of 13.19 per cent per month.

As Scott points out, when it is remembered that the tappers are of superior physique, better paid and have lighter work, it must be admitted that all the quinine which was swallowed by 140 men during a year gave no protection whatever against malaria.

In connection with this matter a communication by Rawnsley, Cunningham and Warnock which appears in the *Journal of the Royal Army Medical Corps* for October, 1918, is of interest. We have not space to quote the tables which they give nor the facts in regard to the effects of hot and cold weather on malaria, but we think that our readers will be interested in the conclusions which they reach, particularly when it is noticed that the number of patients observed numbered many thousand:

"As a result of this intensive course of quinine to nearly 39,000 men the opinion has been formed that complete sterilization of the blood cannot be obtained, that the drug is able to kill off young ring forms, but has no effect on gamete forms; that it has a powerful action by this method of administration of rapidly raising the hemoglobin of the blood. It is also safe to administer such a course of quinine under ordinary conditions.

"The chief measures therefore on which we must rely for the eradication of malaria are those directed to: (*a*) the primary destruction of the mosquito throughout all stages of its development, conducting a very vigorous warfare by means of drainage and canalization, oiling or cresolizing of pools, laying down traps and destruction of brushwood and undergrowth, which measures, to be thorough, should be maintained throughout the whole year in malarial countries; (*b*) the protection of man from the bites of mosquitoes by means of mosquito-proof buildings, nets, gloves, veils, and the use of deterrent ointment; (*c*) destruction of hibernating mosquitoes; (*d*) the cure of the infected to be attempted in the winter months, or (*e*) their removal to cold climates where anopheline mosquitoes are non-existent; (*f*) the maintenance of a high standard of general sanitation.

"Finally, *prophylactic* quinine is a waste of time and money, and a measure which,

on account of its futility, is exceedingly unpopular with those who have to take it. Curative quinine is at present our most powerful drug, but is uncertain in its action and disappointing in its results, and we should search for some other remedy for the destruction of the malarial parasite and the cure of malarial fevers."

SUPERSTITION AND CALOMEL.

In certain portions of the United States there seems to be prevalent amongst the laity an idea to the effect that calomel is a drug which is capable of doing great damage and that it ought never to be administered. On the other hand, there are other portions of the country where it is regarded as so absolutely harmless that it is doubtless abused.

In the section first referred to, people feel so strongly about it that they forbid the physician to embody it in any of his prescriptions and oftentimes seriously impair his efficiency, in a given case, by this limitation of the use of a drug which he believes to be distinctly advantageous.

Part of this superstition arises from the fact that several hundred years ago mercurial preparations were greatly abused in the treatment of syphilis. Certain patent medicine promoters have also endeavored to instill in the public mind the idea that calomel is disadvantageous or dangerous in order to increase the sale of their products, which are said to contain only vegetable laxatives, the thought being that substances derived from the vegetable kingdom must be innocuous while those derived from the mineral kingdom are deleterious. Of course this idea is nonsense. It is a question of dosage and method of administration.

One of the reasons why the objection to calomel is more wide-spread in the south than in the north lies in the fact that southern practitioners usually find the liver more torpid and resistant to the action of calomel than do their northern brethren, with the result that doses are used in the south far in excess of those ever employed in the north, and if, perchance, these large doses are not swept out of the intestine by adequate saline, or other, purgation when the patient is constipated, sufficient of the mercury may be absorbed to produce evidences of ptyalism. When large doses of calomel are necessary the use of a saline purge within twenty-four hours is a wise precaution which should not be overlooked, but in many cases, certainly in the north, doses of one or two grains can be given at intervals, often without being followed by a more active purge, with success as to hepatic function and without any danger of ptyalism.

THE CURE OF GONORRHEAL URETHRITIS.

There have always been those in the profession, and out of it, who have believed that neither gonorrhea nor syphilis once acquired is ever cured. In regard to syphilis there are some reasons for this belief. The first based on clinical observation of the recrudescence of symptoms of the disease after a lifetime of apparent health; the second, upon pathological evidence, particularly that offered by Warthin, who demonstrated both lesions and spirochetes in the vascular and perivascular tissues, particularly those of the large blood-vessels and testicles, in persons whose primary infection dated back many years and concerning whom there had been no suspicion of a venereal infection.

There is hope afforded as to the possibility of a radical cure of syphilis from the combined intensive arsenic and mercury treatment promptly instituted.

In so far as gonorrhea is concerned, very few have entertained the view as to its incurability, because of the abundance of clinical evidence to the effect that the vast majority of men who contract this disease, either because of treatment, in spite of it, or in the course of time, get entirely well and remain so, showing no symptoms during life and no evidence on post-mortem examination of a continued infection.

A considerable percentage of men and

possibly a larger percentage of women do not get well. Since these are the carriers of contagion it becomes a matter of vital importance to establish, if this be possible, a test, or tests, by which it may be positively determined that they are or are not carriers. Many such tests have been proposed, practically all of them based on microscopic examination of the discharge, it being assumed, as a rule rightly, that in the absence of discharge the gonococcal infection has been overcome, and there is no further need of an exudate which is indicative of a local struggle. There may be, however, an inflammatory exudate due to tissue reaction against living and growing gonococci which is not accessible to the diagnostician during latent periods, but which during subacute or acute exacerbations becomes more profuse, its contained organisms at the same time increasing in virulence. Thus it may and does happen that when by the ordinary methods of excluding the presence of discharge containing gonococci—*i.e.*, the examination of the urine, the semen, the expressage from prostatic and vesicular massage, or pus from the periurethral glands, Bartholin's glands, or those of the cervix—the physician may be led to infer that the specific infection is absent. This may not be true and such an error may lead to the gravest consequences.

It therefore becomes needful that a method should be found which can detect the presence or absence of the latent gonococcal infection. A hope has been based on the blood reaction, a hope which has in the main proved fallacious. Pearson (*Journal of Urology,* December, 1918) is, however, convinced that by the use of a provocative vaccine he can so stimulate a latent focus by his added endotoxin that the defensive forces, for a brief time, are overwhelmed, the resistance is lowered, and the gonococcus is temporarily able to proliferate in peace. This negative phase lasts for forty-eight to seventy-two hours, and is followed by a positive phase in which the defenses of the body are stimulated and produce sufficient antibodies to neutralize the added toxin plus the toxin absorbed from the original infection. During the negative phase should any gonococci be hidden in the depth of the tissue they will grow and probably break through to the surface of the mucous membrane.

He further states that in the combat between the gonococcus and the body the promotion of free drainage of the urethra and its glandular structures and the production of congestion, whereby the bactericidal substances of the blood are marshaled to the point of invasion, are valuable aids in the treatment. The adoption of these measures together with the maintenance of bodily and mental health constitutes the sum total of our present therapy. The gonococcidal powers of the body are the first, second and third line of defense, but as the defensive powers against the invading gonococci are strengthened, so also are the defensive powers of the gonococci against the body fluids. In the end the body prevails, but deep down in the tissues a few gonococci may still lurk, practically immune against the resistance of the host but potentially as harmful as ever. When the general resistance is lowered they may burst forth into the urethra and a relapse occurs. While they are latent the symptoms and signs of the disease are absent.

Any condition tending to lower the specific body resistance may cause a relapse of the disease. To produce this a single injection of a potent gonococcus vaccine has been recommended by several observers, notably McDonagh and Asch. The former states that a provocative vaccine will alter the symptoms either positively or negatively, but that the test is unreliable. The latter uses a single large dose and follows it up by a urethroscopic examination to discover if any new lesions are formed. Experimenting with a single large dose it was found that much depends upon the acuteness of the observer, and for that reason the test, as a general routine, is unreliable. It was observed, however, that smears taken on the three or four mornings following the dose of vaccine frequently gave a result positive for the gonococci in cases apparently cured. If a single dose of gono-

coccus vaccine will produce a negative phase of sufficient intensity to enable the latent gonococci to break out of their hiding places and reinfect the urthera sufficiently to produce a positive smear, it is reasonable to expect that if the specific resistance be lowered still further the same result can be obtained in nearly every case. To do this the most advantageous method appeared to be to give a dose one day, followed by a dose the next. The second dose would still further increase the negative phase produced by the first dose. To use too large doses would be inadvisable on account of the severe general reaction produced and the possibility of extending the disease to structures not already involved.

Consequently, it was decided to use two small doses on successive mornings. In no case did the vaccine produce a general reaction nor was any discomfort caused to the patient, and no complications followed its use. The method adopted is as follows: On the morning of the first day a dose of three millions of polyvalent gonococcal vaccine was administered subcutaneously, and at the same time the seminal vesicles, prostate and Cowper's glands were thoroughly massaged to liberate any toxins confined in them. The patient was then instructed to hold his water from midnight of that night until a smear was taken the next morning, and to do the same for each successive night until four smears had been obtained. On the morning of the second day a dose of five millions of the vaccine was administered. Should the case still be infected with the gonococcus, a positive smear may be obtained on one of the four mornings. Should there be no infection with the gonococcus the smear will remain negative for that organism.

He tabulates 100 consecutive cases, from a study of which he concludes that the provocative vaccine gives a reliable result in 96 per cent of cases when used by the above method. It should not be relied upon solely, but should be used in conjunction with other routine tests.

Besides being valuable to determine when a case is cured, this test is useful to differentiate between specific and non-specific urethritis.

Its use renders unnecessary the irritation of the urethra produced by strong provocative injections of chemicals.

THE DENTIST AS A SANITARIAN.

Because of that wave of enthusiastic overzeal which always precedes the general acceptance and rational application of sound underlying principles, it is probable that any patient suffering from ache, pain, or distress in any part of his body of sufficient intensity to drive him to the doctor will be told by the latter, if such an one be modern and progressive, to go to the dentist, who in turn will refer him to the *x*-ray man, who in turn will return the *x*-ray statement to the dentist with the statement that at the roots of one or more teeth there is a condition of chronic sepsis which makes the continuance of seeming health a figment of the imagination, and a speedy and painful death almost inevitable. This is the outcome of the growing view to the effect that the term rheumatism is a cloak to ignorance; that the painful joint or muscle is a toxic manifestation; that the toxin has its seat of origin; that this seat of origin is perhaps most frequently in the tonsils or about the teeth; that many people, helped not in the least by the best obtainable medical advice, have been rapidly and completely cured by such attention as the dentist trained in modern methods is able to give them. Many more have been benefited not in the least by such treatment, and this because the source of the trouble lay elsewhere than in their teeth. From which it is apparent that in the search for impaired health the teeth should be considered by one who knows their physiology and pathology, and that they perhaps should first be excluded, in the absence of definite localizing symptoms, before other regions are investigated.

Whilst the lessons of this war are still fresh in our minds it would seem well to utilize one of them—*i.e.*, the advantage accruing of skilled attention to the teeth applied as a routine measure to groups and

communities. Of the many measures taken to make men fit for their ultimate possible strenuous task, few were more serviceable than those evolved by the Dental Department of the Army. Ill health, which means lessened productiveness, often begins in childhood. It is best avoided by measures taken at this period of life, and of these measures one of major importance, and much neglected, is sanitation of the mouth. The now almost universal medical inspection of the schoolchildren of the States, those who will in future rule the nation's destinies, accomplishes some real good, much on paper, since there is no further use made of a considerable percentage of the examination and record than to tabulate them for the purpose of legalizing salaries and giving a specious vigor to an annual report. It would seem highly desirable, in addition to making this work practically helpful to the individual, to supplement it by that of dental and oral inspection, and practical instruction and discipline in oral hygiene. Money thus expended represents a profitable investment for the State. In this relation a report from Dr. Frederick A. Keys (*Boston Medical and Surgical Journal,* Jan. 13, 1919) embodying the result of the work done by a resident dentist at Medfield State Hospital, Mass., is not without interest. He extracted over 4000 teeth, and nearly 400 teeth were filled. In Medfield, after two years' trial of resident dentists, who accomplished an enormous amount of dental work, they still find enough of the important work—extracting, filling, etc.—to keep the dentist fully engaged throughout the year.

For those who are inclined to accept the teaching of the day, in so far as our schools are concerned, it would seem desirable to have both a dentist and a so-called dental hygienist attached to all the larger institutions and to groups of the smaller ones. The function of the dental hygienist is to clean the teeth and to instruct pupils in the proper method of keeping them in order, a branch of oral prophylaxis carried out by carefully trained women, and, according to the statement of the dentists, accurately, faithfully, and efficiently performed. The employment of such a woman for the cleansing of mouths not put in good shape by a dentist represents obviously a waste of time and effort.

REPORTS ON THERAPEUTIC PROGRESS.

WARFARE INJURIES OF THE LARYNX.

HARMER, in the *Journal of Laryngology, Rhinology, and Otology* for January, 1919, states that the treatment of wounds of the larynx is a difficult matter, and great ingenuity is needed in the management of many of the cases. If centers were provided for dealing with these patients they would enable the surgeons to improve their technique. In the early stages the first essential is to prevent the patient from choking. In all doubtful cases tracheotomy should be performed. Nearly one-third of the cases reported required a tube at some period (tracheotomy, 28 cases; laryngotomy, 4 cases). Crico-tracheotomy is an easy operation, but inadvisable because the larynx is narrower than the trachea; the tube is not well tolerated. Swelling of the mucosa results; pressure, ulcers, necrosis of the cricoid, and granulations supervene; "retained tube" is more common than with other operations. "High" tracheotomy through the upper two or three rings is less dangerous than a "low" operation. As Kocher states: "The danger of fatal complications is much greater with inferior tracheotomy." The latter should be reserved for those cases in which, after careful consideration, it is decided that a permanent tube shall be worn. The treatment of the wound is also very important. To prevent extension of sepsis it may be necessary to open up the wound and provide free drainage; excision of any lacerated tissues is better. The suturing together of divided

air- or food-passages must be carried out on the well-known lines prescribed for cut-throat. To save life partial or total extirpation of a larynx which has been shattered might be necessary. The evidence shows that a gangrenous condition of the tissues often results in death.

Foreign bodies should be removed in all possible cases after careful localization with radiography.

The later treatment should only be carried out by laryngologists. The question of warmth, moisture, inhalations, management of the tracheotomy tube, prevention of dyspnea, and the feeding are all highly important to recovery.

Stenosis.—Tracheotomy may be necessary in any form of stenosis. Moure says: "Nearly all cases have perichondritis at first, some destruction of cartilage, others lesions of the arytenoid joints (serious complications), others injuries to the pharynx or esophagus." It is important to recognize that inflammatory stenosis may disappear entirely. In several patients examined the earlier notes (made by well-known laryngologists) stated that permanent tubes would be necessary unless laryngostomies were performed. A year later they were breathing normally without the use of tubes.

When the patient has recovered from his tracheotomy, the treatment of his stenosis must be considered. To lay down any general line of treatment is impossible. One must devise a method which will not only dilate the stricture, but, if possible, also cause absorption of the scar tissue. Simple dilatation is only practical in a few cases. Removal of scars is useless unless intubation is employed for months.

Moure and other Continental surgeons are strongly in favor of laryngostomy ("le traitement moderne, le traitement de choix"), and, shortly, his method consists in splitting the larynx and trachea, resecting all scar tissue so that the cavity of the larynx is dilated and canalized. The normal structures are often unrecognizable, and care must be taken to avoid injury of the esophagus and removal of the ventricular bands, if possible. As there is a danger of hemorrhage he recommends cauterization of the bleeding points. In one case the patient filled a large bowl with blood, which was surprising, considering that the hemorrhage must have come from unimportant vessels. The larynx is plugged by a gauze roll ("pansement en panier") containing an antiseptic. This dressing is changed every three or four days and replaced after three or four weeks by a special vulcanite tube and cannula or by an intubation tube fixed by a special clip ("Crête d'Aluminum"). Granulations are treated with chloride of zinc (10 per cent) or silver nitrate. In some cases an esophageal tube is used for feeding for a few days. Intubation requires from twelve to eighteen months, after which the cannula can generally be removed, and to close the fistula a plastic operation similar to that used for hypospadias is performed. A second laryngostomy is sometimes necessary. He points out that warfare injuries are infinitely more difficult to handle than ordinary civil cases of stenosis, and that fixation of the arytenoid joints increases the trouble.

The complications which he has experienced are inflammation, edema, abscess, and necrosis of the cartilages of the trachea (once).

The voice results are surprisingly good, and, although rough, phonation is strong and resonant, similar to that obtained after removal of cancers by thyrotomy. Moreover, the patients are cured and can breathe through the natural passages. He has treated sixteen soldiers and fifteen civilians "avec plein succes."

Now, in the hands of Moure, laryngotracheotomy doubtless gives good results, but it is not an operation to be undertaken lightly by laryngologists. Harmer agrees that in every case of "retained tube" the question of curing the stenosis should be carefully considered, and it still remains to be proved that this cannot be effected equally well by simpler methods. In any

case, the early performance of laryngostomy is unwise, and long periods must be allowed to elapse so that general inflammation can subside. If necessary, a low tracheotomy should be performed to prevent the affected part being irritated by the tube. Some degree of fibrous scarring will supervene after all severe infections of the larynx, and it is possible that this can be prevented to some extent by early treatment with radium and *x*-rays, as these have been shown to be effective in the treatment of cheloid. Recently, Pinch has treated several patients at the Radium Institute, and it will be interesting to note the effects obtained. The reaction obtained by rays is sometimes considerable, and in patients without a tracheotomy tube care must be taken not to produce too great a swelling in the stricture.

To maintain the lumen of the air-passage it is necessary to persevere with dilatation by bougies, intubation tubes, or upward-turning tracheotomy tubes, of which a selection is shown. The treatment must be commenced very quietly, as the tissues are often intolerant when inflamed. Small-sized stenosis cannulæ are generally effective, and should not be changed too often. If necessary a general anesthetic should be given for changing the plug at the beginning of the course. After a time a large cannula can nearly always be inserted without damage to the stricture, and if the surgeon and the patient are sufficiently tolerant many cases of stenosis can be cured. Harmer's opinion is that laryngostomy should be reserved for the most severe injuries which have resulted in practical obliteration of the lumen of the larynx. There remains the difficult question as to when it is safe to discontinue the tube. The patient should wear a tube corked for months before it is finally removed. The symptoms should be carefully watched to make sure that the patient is not suffering from air-hunger, breathlessnes, and the like. Some men complain of feeling blown-up if the cork is not removed from time to time.

THE TREATMENT OF INFLUENZAL BRONCHOPNEUMONIA, WITH SPECIAL REFERENCE TO VACCINE THERAPY.

In the *Practitioner* for February, 1919, WYNN states that the relief of pain, cough and sleeplessness will indirectly assist in the production of immunity. Leeches, when obtainable, give quicker relief to pleuritic pain than any other measure. Light linseed and mustard poultices, applied to the congested areas in such a way as to avoid embarrassment of breathing, do much good. Dry-cupping might be revived with advantage. Efficient counter-irritation is far more important in these cases than in ordinary lobar pneumonia. Cough is often allayed by these local measures. Chloretone in liquid paraffin, 1 in 50, used with an atomizer for the throat and nose, may relieve pharyngeal irritability. Linctuses, containing codeine, heroin, or paregoric, may be used in the early stages, but are apt to derange the stomach and must be used sparingly. The cough, though troublesome, is necessary. Paraldehyde, 1 or 2 drachms, in strongly sweetened tea, is the safest hypnotic. A combination of ½ to 1 drachm paraldehyde with 10 grains of trional is often effective but less safe. In the severe cases with great excitement and struggling, one-hundredth of a grain of hyoscine is the only remedy likely to have effect. His experience with it has been fortunate; but it is an uncertain drug, and others condemn its use.

Wynn frequently has seen bronchitis kettles in use, but in a disease with much frothy watery sputum the effect of saturating the air with moisture cannot be good. When sputum is scanty and viscid, small doses of iodides or ammonium chloride may be useful; but when, as is more usual, there is much bronchial secretion, these drugs by increasing it embarrass the breathing. On the other hand, 1/120 grain of atropine occasionally injected with discretion may give great relief.

In these influenzal cases, circulatory failure from depression of the medullary cen-

ter and consequent vasomotor paralysis seems to play as important a part as direct failure. When these are present, our difficulties are great. One great advantage of cutting short the disease in its early stages by vaccine treatment is that circulatory failure is prevented. Much may be done in the way of prevention by aerotherapy, the avoidance of exertion, the administration of cane-sugar, malted milk, honey or milk sugar, to feed the heart, and the administration of oxygen. Many physicians regard the use of oxygen as disappointing, but no remedy is more badly administered. The futile method of holding a funnel over the patient's face is still commonly practiced even in first-class hospitals. Wynn has even seen an india-rubber tube fastened to the pillow, with the open end several inches away from and below the patient's face. Administered through a proper mask and warmed, he has no doubt of its good effects. An excellent method is to enclose the head in a hatbox with a piece cut out to fit the neck, and the oxygen tube passed through a hole in the side. It should be administered for five or ten minutes at a time.

For vasomotor failure, pituitrin ½ Cc. every six hours, and camphor 3 grs. in ether 3 mins. and olive oil 12 mins., given every four hours, in both cases intramuscularly, have given him the best results. Five minims of liq. strychninæ injected every four hours, and alternating with the camphor injections, may be of help in vasomotor failure. In spite of common opinion, experiments show that it has no action upon true heart failure. It is a powerful stimulant to the respiratory center, but this center is already overstimulated by its natural excitant, carbon dioxide. With digitalis and strophanthus we reach highly debatable ground. Their use has again risen in favor, but there is no experimental evidence to support the giving of digitalis to the heart in fever. It is a case of *quot homines, tot sententiæ*. For curiosity Wynn looked up the references on the use of digitalis in fever in various sections of a recent encyclopedia of medical treatment, and found the following opinions: "Digitalis more often does harm than good"; "Digitalis is undoubtedly a useful drug" (in pneumonia); "To attempt to reduce the rate of the heart in fever by administration of cardiac glucosides is, of course, futile." Wynn has used digitalis in many preparations and doses, early and late, but has never seen any result of value. To give to a poisoned heart a drug, which only acts by its poisoning effect, cannot but be bad.

Alcohol has also come into favor again, and in many cases seems to be the only drug used. Beyond the temporary reflex stimulation caused by the local effect upon the mouth, pharynx, and stomach, it is now well established that alcohol is principally a depressant. It also lowers the resisting power to infection. [With this view we differ.—Ed.] Patients accustomed to alcohol are able to detoxicate the amounts usually given, and in such subjects it may be continued without harm. But to give, under the guise of a stimulant, a depressant drug which moreover inhibits the immunizing processes to patients who are unable to neutralize its effects cannot be sound treatment. Still, the pharmacologist must give way to the practical experience of the physician if the latter can prove his case. But no proof has yet been advanced that alcohol is of service in circulatory failure.

Of other drugs, caffeine citrate 5 grains, three times a day in a strong cup of coffee, frequently acts well. In collapse, saline infusions with glucose 5 per cent injected subcutaneously or very slowly into a vein have a distinct life-saving value and are too seldom used.

Only the confirmed therapeutic optimist can face with equanimity these cases of failure from toxic exhaustion. It is difficult to refrain from giving some drug; but the truth must be faced: we have no drug of undoubted value—no drug, even, of which the indications for its administration are clear. Our real hope lies in the establishment of sound lines of specific treat-

ment, so that by its early administration bronchopneumonia may be robbed of half its terrors.

CRITERIA AS TO CURE IN SYPHILIS.

LeComte in the *American Journal of Syphilis* for January, 1919, reminds us that Fournier required the use of mercury and iodide of potassium in doses veritably active and curative by a system of intermittent or successive treatments during several consecutive years, and at the minimum three or four years. The changes that may now be made in this requirement are due both to better methods for discovering a relapse and to the introduction of a more powerful remedial agent than mercury or iodide of potassium.

In treating any infectious disease, early and rapid elimination of the infecting agent with as little damage to the host as possible from the treatment used is the object to be attained. Early eradication means a lessened period of infectivity and perhaps a shorter time under treatment; rapid eradication limits the extent of the lesions produced and lessens, except in so far as they are influenced by location of the lesion, the residual symptoms that must remain from the activity of the infecting agent during its period of life within the host.

It has been shown experimentally that arsphenamine is a spirocheticide that leaves remarkably little side effect as compared with other drugs. Mercury also produces good clinical results. It is true that some can see no reason for its use and others believe that it really exerts a harmful influence, but these are isolated instances and not in conformity with the complete evidence on hand.

Arsphenamine is not, however, a remedy to be used carelessly: in addition to care in administration, relapse, particularly in the nervous system, is to be guarded against and the patient observed carefully and frequently. Just how often it should be given until symptoms and signs clear up is debatable, but experience has shown that it can be given safely every day for three days if due precautions are observed. A somewhat longer interval, about seven days, will probably suffice in all but exceptional cases, the dosage to vary with the patient and specimen of drug used. Its administration may become an emergency operation of imperative necessity at any time. How much of the drug should be given will depend on the case; there seems to be no good reason for exceeding 0.6 gm. for each 150 pounds of body weight, and there are many excellent reasons for giving less than this amount at one time. Neither is there much evidence to warrant continuing the administration after the lesions present have healed and the laboratory findings become negative or when improvement has ceased to follow injection after a reasonably thorough trial has been given. Sufficient time has not yet elapsed to learn of its true value. Under the older methods of treatment, paresis and the other late manifestations developed about fifteen years after infection, the intervening years having been spent in enjoying health as good as that of any of the arsphenamine treated cases that are seen to-day; whether time will show that as high a ratio of late manifestations occur after its use as under older methods can only be conjectured now. If in 1925, or better 1930, it can be shown that late lesions develop later, giving the patient a longer period of healthy life, or that, if they do occur they are less severe and more amenable to treatment, we may consider the drug an advance, while if none of these are proved it must be considered only as an agent for rapid control of symptoms. Some hold that the use of arsphenamine has increased the incidence of nervous syphilis; that is doubtful considering the early stage at which such conditions may be now diagnosed, and it has been shown that the remedy for it lies in a more thorough and rapid utilization of the drug.

Mercury has not been superseded by arsphenamine, and should be used in every case both early and after the more powerful spirocheticide has controlled the acute fea-

tures of the infection. Fournier required three years' treatment with it; now, in view of the rapidity with which lesions not affected by mercury alone can be cleared up by combined treatment and the promptness with which relapse can be detected, this period may safely be shortened. Definite statements are seldom made on this aspect of the subject. It may be held that a fair time would be six months after all symptoms have disappeared, guarding against relapse and resorting to arsphenamine when it occurs. The method of administration will have to be varied with the peculiarities of the patient. Injections probably act most quickly and certainly, larger doses may be given more safely by inunction, while the pain or inconvenience that these methods cause may make it necessary to treat some cases by oral administration. The choice of a salt can be adjusted by individual selection, the object being to administer as large doses as can be safely borne by the patient.

The inference is, then, that in every point except that of length of treatment, Fournier's rules for marriage must be followed. Modern diagnosis and treatment give advantages in detecting and controlling the disease at all times, so that the physician of to-day can make concessions that he could not years ago.

Summarized, criteria for cure to-day include treatment with arsphenamine and mercury until negative blood findings are secured, and treatment with mercury for at least six months after this; observation for eighteen months after this with frequent negative blood examinations followed by negative spinal fluid findings. Any relapse should be considered as a reinfection so far as cure is concerned. Even with this it is scarcely possible to assure the patient that he is cured beyond doubt; he should be informed of his chances for cure and told to report at yearly intervals, in the absence of symptoms, for further examinations.

Reinfection is of course not to be taken as a practical standard of cure since it involves a second course of treatment. Too few of the reported cases of reinfection fulfil the requirements demanded by White before accepting its occurrence, to be of value in judging what treatment is necessary for cure. White's requirements are: (1) A demonstration of spirochetes in the chancre or syphilitic lesions, or a blood giving a positive Wassermann in the first attack; and (2) in the second attack, the spirochetes being found from the new chancre which appeared at a different site from the first chancre, the blood at the same time giving a negative Wassermann reaction.

ARSPHENAMINE AND NEOARSPHENAMINE PLUS ADRENALIN.

In the *American Journal of Syphilis* for January, 1919, BEESON states that it is the purpose of his paper to emphasize the use of adrenalin in certain of the reactions following the intravenous injection of arsphenamine and neoarsphenamine.

Among those who have found adrenalin of value in these conditions, besides the originator of this method, are: Pollitzer, Ravaut, Darier, Committee on Venereal Disease Office of Surgeon-General U. S. Army, Sergent, Florand, Sauphar, Berman, Meddis and Sterling, Wood, Kaliski and Strauss, Schwarzman, and himself. Leredde, although differing with Milian as to the production of the nitroid crisis and serous apoplexy, suggests the use of adrenalin in those conditions.

In using adrenalin one should employ an active solution. It must be protected from the light since it readily undergoes oxidation. This is shown by the production of a reddish color. When this color becomes marked the adrenalin is of little value. Adrenalin can be subjected to boiling for a few minutes in order to render it aseptic. The usual solution of adrenalin hydrochloride 1:1000 is commonly employed and is the preparation hereafter referred to unless otherwise stated.

A good test for determining the quality of adrenalin is the following, which he has

found extremely useful: To 3 Cc. of adrenalin solution one adds a drop of 10-per-cent ferric chloride solution. If the adrenalin is good, a greenish color soon appears which changes to red when it is heated. A deteriorated solution will not give this reaction.

Milian recommends the following doses: By mouth 1 mg. (1 Cc. of a 1:1000 solution), subcutaneously 1 mg. and intramuscularly ½ mg. The last named requires a smaller dose because of more rapid absorption. Per os is easy but of uncertain value, and if several milligrammes are thus given in a short space of time, vomiting may result. He has made but little use of this method, but has given adrenalin in most cases into the glutei just as one would administer an intramuscular injection of an insoluble mercurial salt. The injection is given in two stages because if perchance the needle should rest in a blood-vessel and the injection be given the effect would be extremely unpleasant, perhaps grave, due to the sudden deposition of such a dose in the circulatory current. The intravenous route has been recommended in cases of coma, diluting 1 Cc. of adrenalin (1:1000) in 100 Cc. of normal salt solution. As a preventive agent he believes that 2 mg. will suffice in most "nitroid" patients. One mg. may be given intramuscularly ten minutes before the intravenous injection. In those presenting a marked nitroid crisis we have not hesitated in giving double that amount. It is quite striking to observe the effect of adrenalin in these cases. Patients who would otherwise present a crisis perhaps even before 20 Cc. of the solution had been injected can support the next one very nicely. Sometimes they complain of malaise or exhibit slight reddening of the cheeks. As a curative agent adrenalin will shorten a crisis, but he believes its chief use in nitroid crisis is as a prophylactic. Milian also uses it to prevent fever, headache, vomiting, and diarrhea. Beeson employed adrenalin successfully in the cases of two patients who developed a marked serous diarrhea after each injection. In each of them 1 mg. intramuscularly just before the injection and a like amount by mouth in a little water on the following day was sufficient.

In serous apoplexy larger doses have been given. Florand's patient became comatose on the third day after a second injection of neoarsphenamine 0.30 gramme, given in concentrated solution. Within one hour he received 4 mg. of adrenalin intramuscularly (in three doses). Three hours later the patient was so improved as to take 1 mg. by mouth. He made an uneventful recovery.

Another striking case is that of Sauphar, in which coma ensued on the third day after an intravenous injection of neoarsphenamine 0.20 gramme. This patient recovered under large doses of adrenalin.

Wood's first patient was practically anuric for two days after an intravenous injection of arsphenamine 0.6 gramme. Twenty minims of a 1:1000 adrenalin solution were injected subcutaneously, and about four hours later a like amount of a 1:1000 solution was given by mouth. This dose was twice repeated. A large amount of urine was voided one hour after the second dose. Following an intravenous injection of 0.6 gramme of arsphenamine his second case developed severe nausea and diarrhea, both of which ceased after the administration of adrenalin.

Milian has reported the case of a young soldier who received an intravenous injection of neoarsphenamine 0.45 gramme. On the night of the third day thereafter he complained of a terrific headache and soon became comatose. He was given 2½ mg. of adrenalin by mouth and one hour later 1½ mg. (1 mg. subcutaneously and the rest intramuscularly), and recovered.

Sergent's patient presented symptoms resembling those of acute adrenal insufficiency, profound prostration, vomiting, weak pulse, subnormal temperature, cramps in legs and abdomen, etc., the day after receiving 0.30 gramme of neoarsphenamine intravenously. Recovery was complete under adrenalin.

He does not know just how the adrenalin acts. A purely vasoconstrictor action is not all that it performs, perhaps a cardiotonic action also comes into play. Milian has found that ergotin, a good vasoconstrictor, does not possess the same efficiency in these cases. He states that hypophysine plus adrenalin is a good combination.

The best index to the action of adrenalin is the marked pallor which it produces by constricting the blood-vessels. This "leuco-reaction," as it has been termed, is well marked about the site of injection, and also in the face. It may be slight or intense, but the patient does not faint. When well marked this indicates that the dose has been sufficient.

A generalized trembling is not uncommon after an injection of adrenalin, as are also tachycardia and increased arterial tension. These are not so important, however, as the leuco-reaction. The site of an injection is usually somewhat painful for a day or so.

The subject of reactions following intravenous injections of these arsenical products is a large one. Beeson has endeavored only to bring out some of the most important after-effects and to emphasize the importance of adrenalin, which has in certain of them an effect well-nigh akin to that of a specific.

TREATMENT OF THE ANEMIA IN CHRONIC AILMENTS.

GEYSER, in the *New York Medical Journal* of February 15, 1919, states that there are many ways of combating acute anemia. There is just one successful way of treating chronic anemia, in his opinion, and that is by the exhibition of perhaps one of the oldest and at the same time most abused of blood remedies, namely, iron. Arsenic and iron have, for a long time, vied with each other for supremacy in this respect. The main drawback to the use of either was the uncertainty of their action when administered by mouth and their localized effect upon the digestive organs.

Since the intravenous iron and arsenic compounds have been placed in the hands of the physician, these two drugs have come into their own. When these drugs are given by mouth in the form of Blaud's mass, months, even years, are required before any real therapeutic benefit manifests itself. Even the intramuscular treatment required weeks and months owing to the smallness of the dose. In fact the intramuscular method never deserved to become popular on account of the pain and frequent abscess formation, which was not always due to carelessness on the part of the administrator. The drugs were a foreign body, and as such were obliged to remain too long in a small circumscribed area.

Since the introduction of the intravenous method all this has been changed. The solutions are free from all irritating qualities, they are injected directly into the vein and so are spread over the entire body surface in a few seconds, and they perform their therapeutic function at once and in the right place. With the iron and arsenic intravenous solution the dose of iron contained in each 5 Cc. of the solution is one grain of iron cacodylate. This one grain actually enters the circulating blood stream. In most cases the peculiar odor of garlic is obtained in the breath of the patient less than one minute after the injection. The therapeutic effects on the blood count and the hemoglobin index are demonstrated after the second or third injection. The constitutional symptoms respond to other treatment in exact ratio as the blood picture is improved.

Now and then it happens that the blood count does not improve after the four injections. In such cases there is usually a lymphatic involvement. This sign is almost pathognomonic. Twenty Cc. containing thirty-one grains of sodium iodide are then injected until six to eight doses have been given, then followed by four weekly doses of iron and arsenic. This has never failed in his experience to produce the proper blood picture. There is another pathognomonic sign that has almost become established. In cases of chronic asthma, if the

intravenous injection of four doses of sodium iodide fails to give noticeable relief, we may be reasonably sure that we are not dealing with a true case of bronchial asthma, but some reflex condition.

Technique.—The nurse cleanses the selected area with alcohol, then applies the blood-pressure apparatus and records the mean reading. As soon as the selected vein, usually the median basilic, stands out well, it is grasped between the thumb and forefinger of the left hand and pressed outward toward the skin surface. A 23- to a 25-gauge hypodermic needle is attached to an all-glass syringe, the fluid drawn into the barrel, and the needle inserted in a direction parallel to the vein. If the vein has been properly entered, dark blood will show in the syringe. The nurse releases the pressure and the fluid is slowly injected into the vein. Care must be taken that the fluid does not enter the muscular or cellular tissue. As soon as a localized swelling occurs, the injection must be stopped and the needle properly inserted. If the technique has been correct, there is neither pain, swelling, nor reaction. The anemia in subacute or chronic cases is very promptly overcome. Even in late stages of tuberculosis or cancer the blood picture is favorably influenced, without, of course, any appreciable effect on the disease process. When the blood of a patient can be made practically normal, other measures, if they are based upon the laws of physiology, will cause such patients to respond most rapidly.

EMPYEMA FOLLOWING INFLUENZAL PNEUMONIA.

In the *Journal of the American Medical Association* of February 1, 1919, BALLIN concludes an article by stating that we have to differentiate in the treatment of empyema between three types:

1. The empyema following hemolytic streptococcus infection.

This occurs early as an exudate in the first week of the pneumonic process, is thin, very copious, and capable of being absorbed, and should be handled, if necessary to relieve pressure, with aspiration, operating by costectomy, only after the pneumonia has subsided.

2. The empyema following lobar pneumonia.

This sets in four weeks after pneumonia, and can safely be handled with costectomy.

3. The empyema following influenzal pneumonia.

This also develops four weeks from the onset of the process. On account of serious and frequent metastatic suppuration, its prognosis is more severe than that of Form 2. It is best handled by thorough drainage, by costectomy under local anesthesia.

ANTHRAX CURED BY NEOSALVARSAN.

The *Medical Record* of February 1, 1919, calls attention to the idea which obtains to-day that the non-septic forms of anthrax are amenable to various kinds of treatment, some of which may be quite simple, while septic anthrax, like all sepsis, is very refractory to any plan of treatment. The alleged remarkable cures which find their way into literature are usually of localized forms, which, while they may present a marked constitutional reaction, are seldom septic in the true sense of the term. Much confusion is associated with the management of the disease on this account. Whether serum treatment has ever actually prevailed over true bacteremia is still open to doubt. In the *Correspondenz-Blatt für Schweizer Aerzte* of November 9, 1918, Gsell refers to the use of salvarsan in this affection. In the original case of Becker the general condition was bad, but the blood remained sterile, and this was true of the other related cases. Salvarsan was successful in cases of this type, but made an inglorious failure in others in which bacteremia was present. Only in the laboratory did this remedy cure septic cases, the bacilli dying in the blood within a short time, as shown by failure to develop blood cultures

after treatment. The case referred to was not of especial severity, and was not septic at any time, but yielded so promptly to intravenous injections of neosalvarsan that the result deserved to be called favorable.

CHRONIC ENDOCERVICITIS.

STURMDORF, in *American Medicine* for January, 1919, states that the dominating pathologic factor that determines the morbidity of a cervical laceration is not the extent of the tear but the incidence of its infection. Such an infection does not remain limited to the lacerated area, but sooner or later involves the entire endocervical mucosa from the external to the internal os.

In the treatment of chronic endocervicitis, the failure of prevailing therapeutic methods offers the most convincing evidence of inadequate fundamental concepts.

Chronic endocervicitis is primarily and essentially an infection of the deeply situated terminal tufts of the endocervical muciparous glands. These glandular saccules harbor the infecting organisms for years or a lifetime. Their distention from duct occlusion produces the familiar Nabothian cysts, which may honeycomb the cervical structures or, becoming purulent, riddle it with miliary abscesses.

It is an axiomatic surgical principle, in the control of all infectious processes, to direct our therapeutic aim at the primary focus of infection. In general and special practice, the escharotic, the dilator, and the curette still hold sway as established routine measures, especially for the chronic endocervicitis in nullipara. Mild escharotics and discriminate dilatation, by promoting drainage, may prove of some benefit in very superficial infections, but curettage cannot be too emphatically condemned in any case.

The curette does not and cannot reach the deeply situated infected racemose tufts of the muciparous glands in the cervical tissues, and it should not injure the utricular tubules of the corporeal endometrium, which is rarely, if ever, involved in the disease, and whose specific functions in menstruation and gestation have been permanently vitiated by the lacerations and inoculations incidental to this time-honored traumatism.

The only positive evidence of chronic corporeal endometritis that he has ever seen came from uteri that had been cauterized and scraped from one to several times.

To cure endocervicitis, we must remove the entire infected endocervical mucosa. While endocervicitis persists, its symptoms must persist.

The operation of trachelorrhaphy was originally based on the conception that the local and general manifestations of torn cervices resulted solely from gaping flaps, and that a cure of the condition demanded nothing more than a plastic closure of the gap.

The operation reproduces the original area of laceration and unites its edges by suture. It is obvious that the curative scope of this procedure is thus limited to the cases in which the infection has not extended beyond the lines of the original tear —a rare condition, for we know to-day that the functional disturbances following cervical lesions which demand surgical intervention signalize the infectious invasion of the entire breadth and depth of the cervical mucosa, and that the conservation of the invaded areas, within the cervical canal beyond the lacerated edges, is productive of surgical failures.

On the same lines, a partial or low amputation of the cervix eliminates only a part of the diseased cervical mucosa, while a complete or high ablation of the entire cervix for chronic endocervicitis is an unwarranted mutilation of its muscular mechanism.

When a cervix splits during labor, the rent runs practically in the direction of its muscle fibers. When the cervix is amputated, its muscle fibers are severed transversely. The spontaneous tear, unless infected, exercises but little influence on the muscular mechanism, while the transverse ablation destroys it completely.

To summarize briefly, the cure of a chronic endocervicitis productive of local

and general manifestations, whether in the nulliparous or multiparous cervix, demands a complete enucleation of the entire endocervical mucosa, the preservation of its muscular structure, and the accurate relining of its denuded canal.

PLASTIC SURGERY OF THE EYE AFTER WAR INJURIES.

BUTLER, in the *Birmingham Medical Review*, No. 478, 1919, states that the Esser epithelial outlay method is still in its infancy; and that he has only used it for the past six months, but has had sufficient experience to know that it has immense possibilities in suitable situations, and that it comes to our rescue when other methods are inadmissible. The chief sphere of the operation is undoubtedly in cases of severe burning, when the surrounding skin is parchment-like, and flaps cannot be obtained. He has used it in two such cases, among many others, both epileptics, who had fallen into the fire and literally roasted. In one of them the result has been most gratifying from the cosmetic point of view; the other was too badly deformed to admit of much improvement in appearance, but the cure of double lagophthalmos and the liberation of scars round the mouth have greatly added to the comfort of the sufferer.

He is fully conscious that much more practice and experience is necessary to gain the fullest advantage from this almost epoch-making device.

The advantages are three: The graft invariably "takes," because it is subject to pressure against the surface to which it will adhere, and is kept warm and moist. Again, the method gives free liberation of the contracted area; and it can be used when older procedures cannot be applied.

The operation seems to have the disadvantage that the cosmetic effect is mediocre; the graft has a wrinkled, parchment-like appearance, and some depression remains. Again, the edges are apt to be hard and callous, and call for subsequent excision.

The Esser operation is carried out as follows: An incision is made along the lid edge in the manner already described above. The skin is undermined in such wise that a pouch is formed. A piece of dental "stent" or "dental molding wax" is warmed and molded till it fits into the pouch easily. An epithelial skin graft is now sewn round the stent, which is put into the pouch, and the edges of the pouch are united with four or five sutures. In from a week to ten days the wound opens spontaneously or is opened, and the stent is removed. The pouch will be found to be lined with epithelium. It gradually unfolds, liberating the contracted lid. The actual details of the operation are important. Dental "stent" is spoiled by boiling, but it is still good enough for our purpose. He boils it in an enamel basin, and with sterilized fingers molds it to size and lays it down in a sterilized towel placed on a table provided with a chair of suitable height. On the table are placed needles threaded with thin catgut, needle holder, and conjunctival forceps. Molding wax is easier to use, but it cannot be boiled because it melts to a film which floats upon the water. It must be softened in warm water, molded to shape, and sterilized by immersion in an aqueous solution of bioxide of mercury 1:500. An alcoholic solution tends to dissolve the wax.

The graft, which must be about 1¼ inches square, is cut from the flexor surface of the forearm, arm, or from the inner aspect of the thigh. The arm must be flexed, or the muscles will stand out and the cut will be too deep. The surface is made flat by the use of two thin boards with well-squared edges, each about a quarter of an inch thick. A sharp razor is employed, a stream of saline being poured over its edge as it cuts. The graft must be thin, and should not include any subcutaneous tissue. The graft is now laid on the sterilized towel and spread out with the raw surface downward. The stent is placed on it and the graft sewn round it with fine catgut. The conjunctival forceps are convenient for this manipulation. The line of sutures must be placed so that they lie toward the outside when the stent is placed in the pouch.

When the unfolding is complete it may be necessary to excise the edges, which sometimes remain hard and raised. It is necessary to make the original incision sufficiently long to allow the pouch to flatten out easily, otherwise a pit will persist, and a second operation will be necessary to unfold it. When the graft has to be placed vertically at the inner canthus a secondary intervention is generally called for to complete the unfolding.

The Esser technique is perfectly easy to acquire, but experience is needed to determine the most suitable shape for the stent. A flat crescent seems best for a mold placed above or below the lids. Stents with a round cross-section tend to deep pits with incomplete unfolding. Butler describes an epithelial "outlay;" and "inlay" is used to place grafts in the conjunctiva to remedy contracted sockets, but this is outside the scope of this paper.

SLEEP IN CHILDREN AND ITS DISTURBANCES.

STRAUCH, in the *American Journal of Diseases of Children* for February, 1919, states that sleep disturbances, as a rule, are easily and readily influenced therapeutically. Before beginning treatment the somatic causes, if any, must, of course, first be made out and alleviated; the possible lack of comfort and hygiene and other disturbing extraneous circumstances enumerated before must be considered. The sleep should not be disturbed except for good reasons. Many habits of the nursery, as singing or rocking to sleep, giving unwarrantedly water or milk during the night, too late retiring, taking up the child as soon as he utters the first cry, too much fondling, must be avoided. Irritation, overstimulation of the imagination and provocation of emotions, especially of fear and anxiety, must be avoided, as likewise other errors in education and management.

The more certain it is that fear-effects interfere with sleep, the more must we make effort to free the victim of them by removing the psychic sources. It would be cruel not to alleviate dread. It may be necessary to keep the door open, so the child will know that a person is near-by, or to keep a light burning low, to be turned down soon, of course, and extinguished finally, until in a few days, as a rule, the child will fall asleep alone in the dark room. Suasion by calming words and other suggestive means should be employed by the mother, as sitting at the child's bedside, placing the hand on its head, stroking, offering a glassful of water, etc. Under these circumstances, however, the possibility must be kept in mind of decreasing the profundity of sleep by a strong light, or of the patient acquiring a new sleep-disturbing habit, wanting to be treated always in this way.

Suggestion employed in the waking state has a decided influence on a number of sleep habits and disturbances, in the same manner as on psychogenic disorders manifested during the day.

Many recurring sleep disorders are habits with associations of psychogenic reflexes (pavor, somnambulism, enuresis, etc.). Once the first member of these associations is reproduced, the rest will automatically ensue as a reflex, assuming the type of simple or more complex somatic and psychic processes. The curative mechanism of suggestion lies in the fact that, if the first mental process, the stereotyped provocative conscious or unconscious "memory," is prevented from springing forth, also the supervening psychic reflexes will fail to take place.

An alteration of the psychic life, as, for instance, by change of environment, by transfer to relatives, or especially to a hospital, even a mere threat of it, the separation of the child from the overindulgent mother, introduction of a new nurse with disciplining talent, even a mere change of the bedroom, will contribute much to influence and abolish entirely those mental complexes that, particularly in children, return in a stereotyped manner before sleep overcomes them. With the former conditions altered as indicated, the child takes entirely new and different ideas into his dream life; and

even should the suggestive means fail to prevent entirely the "starting idea," nevertheless it will block and inhibit the otherwise ensuing morbid psychoreflex complex by diverting the associations in another direction. These extraneous changes, though some of them may seem insignificant to the mind of the adult, will frequently bring about a cure within a few nights of insomnia, pavor nocturnus, enuresis, and various other sleep disturbances. This fact also explains the rarity in hospital practice of the occurrence of certain disorders of sleep, as pavor, somnambulism, wakefulness with asking questions, desiring this and that during the night, etc. Promises of reward, threat and punishment, if necessary, will be of aid to the child, as the removing or returning of some favorite plaything. An intelligent, energetic nurse or attendant will work wonders in the home. Also the faradic current is a powerful suggestive means, though rarely necessary.

If in habitual insomnia other therapeutic means are indicated, prolonged, warm, full baths or foot baths, or lukewarm hydropathic packs of body or legs, will often be effective. In temporary sleeplessness due to exhausting acute disease with an urgent indication to induce sleep, as in restlessness of infants from nutritional disturbances with colic pains, or in highly febrile diseases, as typhoid, we should not hesitate to administer drugs until their physiological effect is established, such as chloral hydrate, bromides, trional, sulfonal, or veronal. In the chronic forms of insomnia these drugs are only exceptionally, at most only temporarily, to be prescribed, and then as soon as possible discontinued or replaced by pharmacodynamically mild or even indifferent medicines. The latter, as tincture of valerian, are relied on not so much for their physiologic effect as for their suggestive element, masking the principle of psychotherapy in older children. Therefore, they should be given immediately before retiring, accompanied by a strong verbal suggestion of effectiveness, as by the words, "Take the medicine; it will make you sleep" (Hamburger). The assurance of cure is important for the effect of psychotherapy, in order to make a deep impression on the child's mind.

In exceptionally persistent cases a radical change of the surroundings by transfer to a hospital may be necessary. In combating the symptom let us never overlook the treatment of the underlying nervous diathesis by general hygienic and pedagogic measures.

INFLUENZA AND INFLUENZAL PNEUMONIA.

In the *Journal of the American Medical Association* of February 15, 1919, STONE and SWIFT give the following conclusions as a result of their studies at Fort Riley, Kansas:

1. *B. influenzæ* was frequently encountered in the sputum or throat cultures of patients in this locality during the year preceding the outbreak of this epidemic.

2. From the facts given it appears that *B. influenzæ* or an unknown associated virus was responsible for the invasive features of this epidemic of acute respiratory disease, but that, as the cause of death in the subsequent pneumonias and their complications, the pneumococcus and the hemolytic streptococcus, which was associated with it and which was an organism prevalent in this locality, were largely responsible.

3. From experience based on the study of 1100 patients with pneumonia treated in the medical service of this hospital during the year preceding this epidemic, it is believed that pneumococcus pneumonia, when the hemolytic streptococcus is not prevalent or associated with it, is a disease with relatively low mortality. During an interval of two months (July and August, 1918) preceding this epidemic, in a series of 151 instances of pneumococcus pneumonia the mortality was 9.9 per cent. During these months the hemolytic streptococcus was rarely encountered (1.8 per cent of 162 sputum cultures), and but one empyema occurred, the causative organism being the pneumococcus.

4. Generalized systemic invasion by

the combined infections producing pneumonia occurred in many instances in this epidemic. On the time of such systemic invasion in a pneumonia patient depends, to a large degree, the time of death and the extent of the pathologic processes seen at necropsy. Blood-stream invasion with involvement of many organs due to breakdown of defensive barriers may occur only a short time before death. This explains the large percentage of negative blood cultures in pneumonia, unless taken shortly before death.

5. As a source of information concerning the type of infection present in acute respiratory disease suspected to be due to the hemolytic streptococcus, because of its prevalence in any locality, cultures from tonsil surfaces and crypts on blood-agar plates are recommended.

6. Otitis media occurring during the course of influenzal pneumonia, especially if due to the hemolytic streptococcus, has, in this series, always been accompanied by mastoiditis. Drainage of the middle ear should be promptly secured. Failure to establish drainage may result in bone necrosis of the mastoid, which alone is indicative of imperative operation. Bone necrosis can be detected by roentgenograms so taken as to compare the sound with the affected side on the same plate. At time of operation, as little trauma as possible is essential. The use of the electric bone drill in removing the outer table decreases the trauma.

7. A dull occipital headache in influenza or pneumonia is suggestive of sphenoid sinusitis. Shrinking of the nasal mucous membrane by means of a spray of a 4-per-cent aqueous antipyrin solution affords relief.

8. Lumbar drainage in delirious pneumonia patients is not only a source of diagnostic information, but also is a therapeutic measure of value. This should be repeated as frequently as appears necessary to relieve the pressure of fluid.

9. Tincture of digitalis, standardized to definite dosage and administered to full estimated requirement during the first twenty-four to thirty hours in pneumonia, has lessened the deaths that might be attributed to circulatory failure.

10. The most common complications in this epidemic of influenzal pneumonia were pleural effusions, empyema, pericarditis (serofibrinous or purulent), cerebral edema and meningitis, otitis media and mastoiditis, sphenoid and ethmoid sinusitis, and nephritis.

11. Specific pneumococcus antiserums supplementing Cole's Type I serum are much to be desired, but more attention should be directed to the rôle played by the hemolytic streptococcus in the production of the epidemic types of pneumonia.

12. It is believed that not much may be expected in the specific treatment of pneumonia of the type associated with the presence of the hemolytic streptococcus until a potent antiserum for the various strains of the organism has been produced. Many serums designated as polyvalent are on the market, but opinion is by no means unanimous as to their value in the treatment of pneumonia.

RATTLESNAKES: THEIR VENOM AND ANTIDOTE.

POPE, in the *California State Journal of Medicine* for February, 1919, states that the poison is absorbed like any other hypodermic, showing its first effects in large animals in about ten minutes.

Systematically, there is no antidote. Noguchi proved that the administration of strychnine caused the animals to die more quickly. Alcohol is responsible for 10 per cent of the deaths from snake-bite, and is in no way an antidote. Five per cent of the deaths result from sepsis following the bite.

What is the proper thing to do in snake-bite? First apply a ligature above the bitten part. This must not be too tight, sufficient only to obstruct the venous return, and even this should be relieved momentarily from time to time. The second thing is to expose the part, cleanse or disinfect it, if possible, and incise the skin to the full depth of each puncture. The third thing to do is to apply suction and encourage

bleeding either by a Bier cup or the mouth. Here whisky might be used as a mouth-wash to prevent, as much as possible, infecting the wound with mouth organisms. The venom, of course, is not toxic to suck or to swallow. The fourth act is to inject a one-per-cent solution of chromic acid hypodermically and later apply compresses of this at the site of the bite.

Following this emergency treatment, general measures should be inaugurated. Quiet the fears; rest the body; relieve the pain with morphia; give salt solution, either intravenously or by Murphy drip; give black coffee, use the antivenin for what good it may do; apply warmth to the body; and remember that over 85 per cent get well.

TUBERCULOSIS OF THE UTERUS.

SCOTT, in the *California State Journal of Medicine* for February, 1919, concludes his article as follows:

1. Tuberculosis of the uterine mucosa occurs much more commonly than one would suspect from a perusal of current medical literature.

2. It occurs at all age periods, but is most common in the decade between the ages of twenty and twenty-nine years.

3. The symptoms are disturbances of menstruation, especially metrorrhagia and dysmenorrhea, feeling of weight in the pelvis, progressive constipation, painful defecation, and pain radiating from the hypogastrium to the lumbar region, to the upper thorax, and along the perineum.

4. The differential diagnosis must be made between carcinoma, chronic endometritis, and syphilis of the uterus.

5. The primary form of the disease is comparatively rare, most cases being secondary to the disease elsewhere in the body.

6. It occurs in four main types, ulcerative, miliary, interstitial, and peritoneal. Of these types, the ulcerative is the most frequently found.

7. The prognosis is extremely unfavorable in all except the rare primary cases.

8. The treatment in the secondary cases must be symptomatic and supportive. In the primary cases, curettage of the uterus will result in a cure, if the disease has not invaded the Fallopian tubes. If the tubes are involved, hysterectomy must be the operation of choice. Operative procedures on the uterus, when the seat of secondary tuberculosis, are harmful and are positively contraindicated.

THE AFTER-TREATMENT OF AURAL, NASAL AND ANTRUM OPERATIONS.

WILKINSON, in the *Journal of Laryngology, Rhinology, and Otology* for January, 1919, states that Mr. Banks-Davis, in his Presidential address in Otology raised the question as to the best after-treatment for cases of "radical" mastoid operation. Like Banks-Davis, Wilkinson has tried all the recognized methods. For the last twelve months he has been using a modification of the Carrel-Dakin "progressive sterilization" method, which has given him better results than any of the methods previously tried.

He completes the operation by making a downward-turning plastic meatal flap, which has the advantage of leaving the antral cavity freely exposed. He inserts a large, but not tightly fitting, open rubber tube through the enlarged meatus. It is important that the tube should not press tightly on the edges of the meatal incision, otherwise perichondritis of the pinna is apt to be set up. The retroauricular wound is completely sutured. A single fold of aseptic gauze is carried round the pinna, but no dressing at all covers the meatal tube. The whole ear is covered by a perforated zinc shield, fixed in position by tapes tied round the head. The patient lies on the opposite side, and the nurse is instructed to run the Carrel-Dakin solution into the tube with a dropper every two hours. The shield is simply raised each time the wound is irrigated, and subsequently replaced. He has also used acriflavine solution for irrigation. This also gives good results, but he thinks not quite so good as the Carrel-Dakin solution.

The figure shows the shape of the shield and the method by which it is fixed in posi-

tion. It will be noticed that the edges of the perforated zinc are covered by a split rubber drainage-tube. The shield is sterilized by boiling.

The irrigation is kept up for a fortnight, at the end of which time the wound is sterile. The drain-tube is then removed, and the meatal flap is found to be fixed in posi-

Cage for Carrel-Dakin treatment of mastoid wound.

tion, and the meatus well open. The postauricular wound is usually healed. The further treatment consists in light packing of the meatus with a strip of bismuth gauze. At this stage the packing can be done quite painlessly. The shield is usually worn for six weeks to prevent infection of the wound from outside. The ear is usually about dry at the end of six weeks.

Wilkinson uses a similar shield after nasal operations (as shown in the figure). It has the great advantage of preventing infection of the nose from the outside by the patient's fingers or handkerchief. Before he began to use this shield he never succeeded entirely in eliminating this source of infection, in spite of the provision of sterile swabs for the patient's use.

It appears to him that there are two principal sources of infection to be guarded against in nasal operations: (1) infection from the outside, usually conveyed by the patient's fingers; (2) entry of vomited matter into the nose during or subsequent to the operation. The use of the cage eliminates the first danger. The second factor has to be reckoned with only in cases operated upon under general anesthesia. He considers it a very real danger, and he has seen several cases of infection of the maxillary antrum following soiling of the nose by vomit. The tendency of the patient to vomit on partial recovery from anesthesia seems to be increased by preliminary preparation of the nose by cocaine and adrenalin, and by operating in the sitting position.

To prevent this accident, for several years he has made it a rule to employ intratracheal intubation, with sponge packing of the pharnyx, in all nasal operations done under general anesthesia—even submucous resections. The control of the anesthesia is much better, and all danger of entry of blood, secretions, pus or foreign bodies into

Cage for use after nasal operations.

the lungs is obviated and also the danger of the nose becoming soiled by vomit is much reduced. At the conclusion of the operation he packs each nasal fossa with a rubber sponge tampon. The patient is rolled right forward onto his face before the pharyngeal sponges and tracheal tube are removed. The nasal tampons are removed

on the morning following the operation. The shield is worn for four to seven days.

Though outside the immediate scope of the title of this communication he refers to the good results obtained by the use of acriflavine in cases of suppuration of the maxillary antrum. He has used it in six cases in the following manner: After puncturing the antrum he washes out with a mild alkaline solution or a solution of boric acid, and afterward dries the cavity by blowing air through. He then lateralizes the patient's head, and runs in through the cannula one or two drachms of warm 1-in-1000 solution of acriflavine. The head is kept on the side, slightly tilted backward, for five minutes, and then bent forward to allow the excess of solution to run out of the nose. At the next washing, two or three days later, one obtains one large "blob" of transparent yellow-stained mucus mixed with flocculi of opaque orange-stained pus. The lavage is repeated at intervals until the yellow blob is obtained free from the orange-stained pus element. The acriflavine is then discontinued, and at the next washing the antrum is usually found to be clear. He has not employed acriflavine up to the present in any old-standing cases with profuse suppuration and thickened polypoid mucous membrane lining, but one of the cases in which the method has succeeded was of six months' and another of three months' duration, and his previous experience of treatment by lavage would not have led him to expect a cure by that method alone without the acriflavine.

SCOPOLAMINE AND MORPHINE NARCOSIS IN CHILDBIRTH.

Das, in the *Calcutta Medical Journal* for November, 1918, states that early in 1917 under the suggestion of Major Steen he started his experiments. He has used scopolamine and morphine in 50 cases up to the present, 44 being at the Hospital and six amongst his private patients. Out of the 50 cases his first 10 cases were absolute failures, because at the beginning he had not picked up the full technique and his selection of cases was not what it should have been.

He believes that the great secrets of narcosis are the dosage and the opportune moment in the first stage of labor when it should be given.

The results of his 40 mature cases were as follows: In 25 cases he got complete amnesia, in 11 cases partial amnesia, and it was absent in 4 cases; and in 19 cases complete analgesia, partial in 11 cases, and absent in 10 cases.

After he had done 30 cases he was able to sum up the technique, and he drew up a manuscript chart of the labor room with the sanction of his chief based on the Freiburg technique, for the convenience of the medical staff and nurses. A specimen chart is given in his monograph.

His technique is as follows:

1. The physician must fully acquaint himself with the literature on the subject.

2. He must have a good personal experience of some cases done by one who has had considerable practice with the method. Gauss says that the physician should have at least a year's experience in one of the well-regulated hospitals, but he is of the opinion that it is not necessary. He advises one to get his experimental knowledge in a maternity hospital or any special clinic where he can choose his subjects and get the help of well-trained nurses.

3. The physician must thoroughly examine the patient's general condition; take her pelvic measurements; and note the position of the child, get a history of her previous labors, and ascertain her idiosyncrasy if any as regards drugs.

4. No physician should attempt to conduct a case unless he has the necessary experience to tackle obstetrical interferences.

5. There should be a specially equipped labor room, quiet and darkened, and protected from all noise and confusion.

6. Although some authorities hold differently, his present view is that the physician must be in *constant attendance* on the patient. He does not mean that the doctor should sit beside the patient during the entire period of labor, but that he should be

either on the premises or ready with his motor and telephone waiting in his house. He should not be engaged with any other patients.

The fact of having to be in constant attendance is a great obstacle in making the administration of these drugs popular in private practice. Doctors in private practice have very frequently a number of responsible cases all at the same time on their hands, and if they were to give their time and attention entirely to one particular case the other cases would be neglected. Even if this could be done it would mean a heavy fee which may deter the average patient of moderate means from undergoing the process of "twilight sleep." Further, a physician by confining himself entirely to a single case would be depriving the public of his services for the time being, more so if he is a specialist, in which case his services might be so valuable for another patient as to save his or her life. Hence he thinks that hospitals, private clinics, and nursing homes with resident doctors are the most suitable places for such cases. If, however, a case of this nature is conducted in a private house there must be a competent qualified assistant especially trained for the purpose to help the attending physician. The administration of the drugs should not be left in the hands of nurses whose indiscriminate use of them or unintelligent application of them according to routine charts might cause serious consequences. He mentions that a well-known Indian medical service officer lost his first child, which was born in twilight sleep, because the doctor could not reach the case in time to revive the baby, which was in the hands of a qualified European nurse. Even if it is taken for granted that this was the only mishap in the course of the practice of the obstetrician in charge of the case, still there is no reason why a baby's life should be sacrificed even in the ratio of 1 in 1000 or 10,000 by not taking proper precautionary measures.

What Das says is from his own limited experience, and he states that he may be overcautious. Sir Halliday Croom advocates the use of the drugs in private practice with the assistance of a competent nurse. Some recommend that the first initial dosage of morphine and scopolamine may be given by a nurse to a primipara, when the pains occur regularly every five minutes, and in a multipara when labor actually commences. He says that it is also perfectly safe for her to give subsequent injections of 1/1000 grain of scopolamine every half-hour until the physician arrives.

7. Smoked or dark glasses should be applied to the eyes, or bandages (if not available, handkerchiefs) may be used to blindfold the patient's eyes as the pupils become dilated.

8. Plugging the ears is helpful (cotton soaked in oil) to prevent disturbance.

9. A specially trained and trustworthy nurse or midwife who has a fair knowledge of the process, and who is competent to deal with babies in asphyxiated or oligopneic condition, should be in attendance. The attention of the physician may be demanded by the mother for untoward complications, as postpartum hemorrhage, etc., and the nurse may be required to attend to the baby.

10. The usual paraphernalia for instrumental childbirth should be at hand.

11. The first injection should be given when the internal os has dilated at least one finger loose or two fingers tight and the cervix has been taken up, pains recurring regularly at intervals of not less than fifteen minutes in a primipara. In a multipara it can be started from an early period in the first stage.

12. In all cases of primary uterine inertia it (injection) is contraindicated, and he thinks the injections should not be given where operative interference is expected, as it will be necessary to resort to chloroform.

13. *Dosage.*—This differs in different clinics and no two agree between themselves, and each claims its own method to be superior; but they all now agree to start with a fair dosage of scopolamine gr. 1/150 or 1/200 and morphine 1/6, or ⅛ of heroin hydrochloride or narcophine; and they give a small dose of scopolamine

at regular intervals till the desired effect is obtained.

The technique of dosage he describes as follows: First dose hyoscine hydrobromide gr. 1/150 with morphine hydrochloride gr. 1/6 in separate solutions (hypodermic); and then every hour or two hours, according to the grade of amnesia, scopolamine gr. 1/400 is given till complete amnesia is obtained as tested by the memory test—*i.e.*, when patient remembers nothing twenty minutes after the first injection or, in other words, when a state of forgetfulness for recent events has set in.

The number of doses (injections) is of no importance; as a rule three to five injections were quite sufficient in the successful cases (as many as 10, 11, 14 and even 27 injections have been given at different clinics).

TREATMENT OF SCARLET FEVER.

In the *Ohio State Medical Journal* for February, 1919, BELL states that he has been accustomed to tell students that the treatment of scarlet fever may be expressed in three words—"bed, milk, and water." This of course may be considerably amplified, but if it is borne in mind, the patient will at least not suffer from bad treatment. He is accustomed to keep all patients in bed for three weeks, and longer if complications are present. A light case should be treated with as much care as a severe one, as a nephritis may follow the mildest cases. In a series of over three hundred cases his percentage of nephritis was two. This was not luck, but may be reasonably attributed to care, as other statistics range between three and thirty per cent. Traces of albumin and occasional casts do not constitute nephritis, but he regarded it as such when albumin, casts, red blood cells, and an abnormal specific gravity, with or without diminished urinary secretion, were present.

A urinalysis, *including microscopic always*, should be made at least twice a week for the first four weeks. The specific gravity should be taken daily by the nurses the latter part of the second, the third, and first half of the fourth weeks, as the time when nephritis is most likely to occur. A decided drop or elevation reported should put one on guard and a microscopic and chemical test be made at once.

As there is no specific treatment for scarlet fever, elimination of toxins in a natural way is logical. Water or lemonade is given every two hours during the day with twelve to thirty grains of potassium citrate according to age, and at four-hour intervals in the night with double dose of the drug, during the first four weeks, while neutralization of the urine is valuable. One is assured in ordering this combination at stated intervals that his patient will get enough water.

The ideal diet for the first three weeks is milk, but to prevent monotony, small amounts of cooked cereal, bread, crackers, or ice cream, but in sufficiently small quantities not to interfere with the desirable amounts of fluid indicated, may be given.

During the fourth week vegetables and cooked fruits are added; in the fifth week soups; at the end of the sixth week meat—completing the full diet, unless contraindicated by the condition of the kidneys.

Hot alkaline throat irrigations during the acute stage are given every three hours during the day and at night when required.

This does away with the gargling, which is painful, and the larger amounts of hot water are more efficacious.

An ice-bag is applied to the throat where tender and enlarged glands are present.

In a patient who is at all septic, or whose fluid intake is insufficient, the Murphy drip, or if unsuccessful, larger amounts per rectum, or normal salt solution, Fischer's, or glucose solution, at three- or four-hour intervals, are given. The fluid intake and output should be charted. If these measures do not bring about the required results, it is a mistake to think of hypodermoclysis or venous infusion of the same as merely last resort treatments, but give them early and often, as elimination and dilution of the toxins is the only salvation for the patient, and we must get fluids into them some way.

Heart and kidney complications are treated as in other diseases.

Patients with scarlet fever or measles seldom complain of pain in impending otitis media. Unless the drums are examined daily during the acute stage, the first indication of this condition is most frequently a discharging ear. A paracentesis for a bulging drum would have been preferable. The subsequent treatment depends upon the judgment of the aurist. The mastoids should always be inspected and palpated on each examination.

Antistreptococcus serum even in doses of 80 or 90 Cc. have never given any results in the treatment of this disease, according to Bell.

For immunization against scarlet fever with streptococci taken from the throats of patients having this disease he has had no experience, although good results have been reported.

The same is true of the treatment by means of convalescent serum, because of the mechanical difficulties he has experienced in the past in withdrawing the blood.

As early as 1911 or 1912, Professor Schwenkenbecker of the Frankfurt Hospital Medical Clinic treated early some of the most severe cases with intravenous injections of a polyvalent serum (healthy as to a syphilis and tuberculosis and taken late in convalescence) with doses of 40 Cc. for children at intervals of from one to seven days, according to severity of symptoms. He reported saving many otherwise hopeless cases.

More recently Abraham Zingher reported some work with the convalescent and normal serum. The convalescent serum taken from patients in the second and third week was used in the early toxic and malignant cases seen before the fourth day. The blood, half an ounce for children and 1 ounce for adults, used fresh and citrated, was injected into the triceps, outer regions of both thighs, the calves and both gluteal regions, making three or four ounces for children and six or eight for adults. Several injections on subsequent days were necessary in some cases. He used normal blood, citrated, in the late septic cases (from fifth to eighth day) and in slightly larger amounts. These injections were repeated once or twice at intervals of two or three days as indicated.

In both classes of cases Zingher reports a great reduction in the mortality, which is otherwise uniformly high. Unquestionably this procedure should be tried when possible in this type. He describes the technique of the withdrawal of blood and the citration as simple. For the details of this he refers the reader to one of his articles published in the *Journal of the American Medical Association* of September 4, 1915.

In this paper the writer does not refer to the standard texts and only in a few instances to publications, but has confined himself to his own impressions—to diagnosis and therapy as applied in his service over a period of nearly eight years in the wards of the Cincinnati General Hospital.

CLINICAL RESULTS IN TWO HUNDRED TRANSFUSIONS OF CITRATED BLOOD.

LEWISOHN, in the *American Journal of the Medical Sciences* for February, 1919, says it is not advisable to advocate large transfusions. They may overstrain the heart, and cause the death of the patient. Except in cases of profuse hemorrhage the average transfusions should range between 500 and 700 Cc. Very large ones are not more effectual clinically than medium-sized ones. Formerly large transfusions were quite *en vogue*. However, the simplicity of modern technique makes repetition of transfusion an easy matter and has replaced single large transfusion by repeated transfusions of medium size.

Nothing definite is known about the fate of the donor's blood after its introduction into the recipient. We do not know how long it preserves its own vitality nor when it is assimilated by the recipient's blood. That in a great many instances it acts as a stimulant for the blood-producing organs of the recipient can be seen from the fact that many cases show a rapid automatic rise of

the hemoglobin a few days after the transfusion. This result is obtained just as effectively by medium-sized as by large transfusions.

The general popularity which the citrate method has acquired in the last year makes it unnecessary to enter into long discussions as to the relative values of citrated blood to non-citrated blood. It has been established beyond doubt that the clinical efficiency of the citrate method is absolutely equal to any other method of blood transfusion. Many authors have tested the relative values of the different procedures by using various methods on the same patient (Bernheim, Garbat, author, etc.), and have shown that results obtained by the citrate method are just as good as those obtained by the older and more complicated methods.

It seems hardly fair to group the other methods as methods applying pure, unmodified blood, as has been done by some authors, in contradistinction to the citrate method. Citrated blood is just as pure as non-citrated blood. One of the most efficient and life-saving qualities of the blood is its tendency to coagulate. The possibility of existence of the human being is based on this fact. However, it was just this coagulation tendency of the blood which stood in the way of a development of a simple technique for blood transfusion. There can be no doubt that during the transfer of blood from donor to recipient the coagulation tendency of the blood is useless and unnecessary. The effectiveness of sodium citrate is based upon the fact that it changes temporarily during the transfusion this coagulating tendency of the blood without changing any of its other qualities.

The amounts of sodium citrate used with this method are so small that they do not play any rôle in the chemical and clinical properties of the recipient's blood. "Even after profuse hemorrhage there is enough calcium left in the blood-vessels and in the lymph for reëstablishment of coagulation conditions in the transfused blood" (Sabattani). In other words, the mixture of sodium citrate is efficient as anticoagulant only while the blood is outside the body. Soon after its introduction into the recipient the coagulating efficiency of the transfused blood is fully reëstablished. It is probable that the sodium citrate is either changed or rapidly excreted by the kidneys.

The frequency of chills following transfusion does not seem to vary much according to the different methods used. In a series of 280 transfusions, Meleney, Stearns, Fortuine, and Ferry observed the same percentage of reactions from the citrate method as with the syringe-cannula method. They conclude that the method of transfusion has nothing to do with the occurrence of the reaction.

According to the experience of the author and others, chills occur somewhat more frequently with the citrate method than with other methods of blood transfusion. In Lewisohn's series of 200 transfusions he encountered chills in 40 cases (20 per cent). The reasons for these chills, if proper blood tests were made before the transfusion, are not quite clear. He has repeatedly seen that in the same person citrate transfusions did not cause any chills, whereas subsequent transfusions of non-citrated blood caused acute rise of temperature with chills, and *vice versa*.

It is interesting to note that in the first 22 transfusions of his series no chill occurred. Furthermore, he has never observed a chill following transfusion given to children, even when rather large amounts of blood, as compared to the body weight, were introduced. No chill was encountered in any of those cases in which transfusion was given following a profuse hemorrhage.

It is by no means impossible that future investigators may find another anticoagulant which may possibly diminish the percentage of chills. However, it is safe to say that the principle of the method (application of an anticoagulant for the simplification of the technique of blood transfusion) will prove of permanent value. The application of this principle has transformed transfusion from a very cumbersome and difficult method into a most simple procedure. Blood transfusion at the present time is not any more in the hands of a few

specialists, but within the reach of every practitioner. By the immediate application of this simple method of blood transfusion in emergency cases a great many lives can be saved, especially in small communities, where the performance of the older, more complicated methods was out of question.

THE LOCAL TREATMENT OF ACUTE RHINITIS.

THOMPSON, in the *Ohio State Medical Journal* for February, 1919, states that one of the first aims in the treatment of acute rhinitis should be to secure contraction of the swollen turbinate bodies. Normal respiration through the nose protects the throat and lungs against the irritation of cold, dry, dust and germ-laden air. It also helps prevent the dangerous extension downward of the inflammation to the lower air-passages.

A second important object gained by shrinking the turbinate bodies is the drainage of the accessory sinuses of the nose. The severe headache of a bad cold is caused by the swollen turbinates blocking the normal openings of the sinuses; absorption by the blood of the contained oxygen in a closed cell may cause a vacuum headache. Penned-up secretion may cause pain by pressure, or it may decompose, and the resulting gases cause such pressure as to produce agonizing headache. No safe dose of opiates will ease the suffering caused by a blocked sinus. Drainage alone will relieve the pain. Direct extension of the inflammation to the lining membrane of the cells is much less liable to happen if drainage is maintained. The best medicine we have for shrinking the turbinates is adrenalin, but if it is used, in watery solution, often enough to keep the nose open it is irritating and in many cases aggravates the attack. A solution of adrenalin in oil does not irritate if used at proper intervals, and its physiological action lasts longer than when used in water solution. Chemists have said an oily solution was impossible, but John Uri Lloyd has made it for Thompson. The solution is active and durable, not undergoing decomposition like other preparations on the market.

Another object to be sought in the treatment of acute rhinitis is the checking of the excessive watery secretion, in the second stage. This fluid carries the infective germ to the lower air-passages. It excoriates the upper lip and the vestibule of the nose, adding much to the misery of the patient. It washes away any remedial agent that may be used in the nose before it has time to be effective. If this nasal secretion can be checked without injury to the other organs, it should be done for the speedy cure and comfort of the patient. Atropine has long been used for this purpose, but it has been given by the mouth. Administered in this way it checks the excretion by the kidneys and the secretions of the digestive tract. Both of these actions are harmful, and its use in this way is not justified. Atropine has a direct action when applied locally and should be used only in the nose. The alkaloid is soluble in oil and is physiologically active when so dissolved. Patients of his have used it more frequently than ordered and have been very much frightened by the temporary blindness from its mydriatic effect.

Antiseptics to destroy the infective germs in the nose should be included in any solution used locally in the treatment of acute rhinitis. Most of the active antiseptics are either too irritating or too poisonous for use on the nasal mucosa. Besides, as Wyatt Wingrave has shown, they coagulate mucoid or albuminoid secretions and make the cleaning of the membrane more difficult. Menthol, camphor and monochlorphenol are the antiseptics clinical experience has shown to be most effective for mucous membranes. They all have an anesthetic action, thus giving symptomatic relief. Monochlorphenol is rather irritating in the nose and is more valuable in throat infections like follicular tonsillitis. Used in two-percent solution in oil, as a swab for the nasopharynx and as a tracheal injection, it will prevent the extension of the acute inflammation downward from the nose.

When using remedies by tracheal injec-

tion, their constitutional effect when absorbed must be considered, and the dose will in part determine the strength of the solution to be used in the nose. While the title of this paper apparently limits the scope of this brief contribution to the treatment of the nasal inflammation, the welfare of the patient demands we prevent the extension of the nasal inflammation to the lower air-passages, or cure this inflammation, if present when the patient comes for treatment. If monochlorphenol is added to the solution used in the nose we have an effective prophylactic and curative agent for the nasopharynx, larynx, trachea, and bronchi. Putting the rational indications for treatment into concrete form, the prescription would read:

℞ Atropinæ sulph. (alkaloid), gr. ss;
Adrenalin, gr. j;
Menthol, gr. xxiv;
Camphor, gr. xl;
Petrolat. liq.,
Ol. amygdalæ dul., ää q. s. f℥ viij.

M. ft. sol. S.: Use in atomizer.

He has used this solution now for five months, and it has given him better results than anything ever employed before. The rhinitis has been cured in from one to three days in all cases seen early in the attack. No case seen before laryngitis and bronchitis had developed has had any serious involvement of the lower air-passages.

THE STIMULATION AND INHIBITION OF THE GASTRIC SECRETION WHICH FOLLOWS THE SUBCUTANEOUS ADMINISTRATION OF CERTAIN ORGANIC EXTRACTS.

Rogers, Rahe, and Ablahadian, in the *American Journal of Physiology* for February, 1919, give their conclusions as follows:

1. A slightly alkaline saline solution, or alcohol, extracts from the thyroid some non-coagulable material which is a vigorous stimulant for the gastric secretion.

2. This material produces its effects at least in part by intensification of the functions performed by the terminal filaments of the (gastric) vagus.

3. Extracts similarly made from the pathological tissue of adenomatous or hyperthyroid human glands are inert.

4. Extracts of the adrenal gland vigorously inhibit gastric secretion.

5. These extracts of the adrenal gland all contain more or less adrenalin, and therefore it is presumable that their effect is produced by intensification of the inhibitory function which is ascribed to the (gastric) sympathetic.

6. Adrenalin is not as active a gastric inhibitor as the adrenal nucleoproteins obtained from extracts of the whole gland. These adrenal nucleoproteins contain only traces of epinephrin.

7. Extracts of the pituitary gland also inhibit gastric secretion, but only about one-half as vigorously as do extracts of the adrenal.

HORMONE CONTROL OF RENAL FUNCTION.

Endocrinology: The Bulletin of the Association for the Study of Internal Secretions, for October-December, 1918, points out that the possibility of adrenalin control of the kidney has not been investigated so extensively as in the case of pituitary extract. It has been demonstrated that adrenalin produces diuresis, and recently Addis, Barnett and Shevky have shown that this is accompanied by an increase in the urea excreted. These authors think that adrenalin stimulates (secretory) sympathetic termination. Cow on the other hand has not only demonstrated a direct vascular connection between the medulla of the suprarenal and the kidney, but has shown that under certain conditions adrenalin is poured by this path into the kidney, producing a diminution in the flow of the urine. Gunning has also found that intravenous injections of adrenalin cause an inhibition in urine flow in both anesthetized and unanesthetized dogs. The inhibition, however, is very brief, as he says that it persists until shortly after the blood-pressure reaction is complete. Although he did not observe diuresis following, it would be well to base conclusions upon urine flow over longer

periods of time, as Addis and his collaborators did. Moreover, the determination of some constituent in the urine, such as urea, per unit of time, is highly important. It may well be that very small amounts of adrenalin such as those absorbed from subcutaneous injection cause diuresis which can be detected over periods several hours in length, while larger doses which are effective immediately produce the opposite result. However, the hypothesis that the adrenal produces some substance which is necessary for the maintenance of normal kidney function needs further confirmation. The work of Marshall and Davis is very suggestive. They found decreased excretory power in the kidneys of adrenalectomized cats. Of course this might be explained by the lowered activity of the tissues in general.

It is possible that other hormones may influence kidney activity. Cow extracted a diuretic substance from the mucous membrane of the alimentary canal, especially the duodenum. He suggests that this substance is carried by water on its way into the blood stream from the gastrointestinal tract. Piticarin has shown that secretin is also diuretic in action.

The question of hormone control of the kidney is extremely important, and although it appears that we are well along toward its solution, there are many points still unsettled. It is only through carefully controlled experiments of long duration by both laboratory and clinical workers that it can finally be answered.

TREATMENT OF BRONCHIAL ASTHMA WITH VACCINES.

In the *Archives of Internal Medicine* of February 15, 1919, WALKER states that of twenty-eight patients with bronchial asthma who were treated with vaccines of the bacteria to which they were sensitive, 75 per cent were relieved of asthma and 21 per cent were improved.

Seventy-five non-sensitive patients were treated with vaccines made from culturing their sputum on plain agar; the predominating organism was usually the one selected for treatment; 46.6 per cent were relieved of asthma and 16 per cent were improved.

Twenty-four non-sensitive patients were treated with vaccines made from culturing their sputum in dextrose bouillon and using only streptococci; 37.5 per cent were relieved of asthma and 25 per cent were improved.

Thirty-five non-sensitive patients were treated with vaccines made from culturing the sputum both ways; in other words, many types of vaccines were used; 31.4 per cent were relieved and 23 per cent were improved.

Sixteen non-sensitive summer asthmatics were treated with vaccines; 31.2 per cent were relieved and 25 per cent were improved.

Therefore, of 150 non-sensitive asthmatics who were treated with vaccines, 40 per cent were relieved and 20 per cent were improved. These results should be compared with the treatment of sensitive patients as reported in the previous article, 75 per cent of whom were relieved; and in this article, 75 per cent of whom were relieved.

With the sensitive cases, the age of onset of asthma, the duration of asthma and the age of the patient when treated had little to do with the prognosis; however, with the non-sensitive cases these facts had much bearing on the prognosis. The older the patient is when asthma begins and the older he is when treatment is begun, the more unfavorable the prognosis from vaccines in non-sensitive cases.

The permanency of relief from vaccines in the non-sensitive cases depends on the individual's resistance to the bacteria in question; therefore, the duration of relief from asthma varies. Some patients continue free from asthma after vaccines are discontinued for many months, others for only a month or two, and some patients require the constant use of vaccines to be free from asthma. Succeeding courses of vaccine treatment, provided that there has been no change in the bacteria which are causing the relapse, seem to relieve more promptly than

the first course of vaccine treatment; when a relapse is not relieved by a second course of vaccines which previously did relieve, other bacteria should be suspected as the cause of asthma and new vaccines should be made.

ELIMINATION OF DANGER IN THE TONSIL OPERATION AND END-RESULTS.

In the *Wisconsin Medical Journal* for February, 1919, PFISTER states that every tonsil operation is a major operation, and that we have two kinds of major operations: the emergency operation and the operation of choice.

The tonsil and adenoid operation belong to the second class; that means that the physician has additional responsibility when he advises or urges this operation. Any severe accident that might occur in connection with it must be of grave consequence to him. Occasional reports of fatalities have been responsible for the fact that this operation is feared very much, which fact again adds to the physician's worries when he is compelled to reassure the patient or parent in order to have permission for the necessary operation.

Like all major operations, the tonsil (and adenoid) operation can never be guaranteed to be positively free from danger (we read of deaths in extractions of a tooth), but a great many things can be done to make it a comparatively safe surgical procedure.

The dangers lie in the anesthesia; in the asphyxiation through the aspiration of blood clots; in the immediate or postoperative hemorrhage; in the pneumonia following operation, usually due to blood aspiration; and in the so-called "status lymphaticus."

If we can improve our methods to such an extent that we can say the danger as to life in a patient has been reduced to a minimum, we have robbed the operation of its terror.

One of the principal factors for a good and safe operation is that it should be done in a hospital, and that the patient be left there at least twenty-four hours. It need not be emphasized that the home operation is not any more justified than an appendicitis operation at the house—that the dangers in the private house are multiplied. Only where hospital facilities are not available—and those conditions are not so frequent at present—should a house operation be considered. To be sure, we all have done them at the house and at the office, but so have we formerly done other capital operations; but not now. We are continuously striving to eliminate dangers of operations.

As to anesthesia: Local anesthesia as we use it in most of the adult patients is practically free from danger. The general anesthesia for an operation in the mouth is the most difficult form of anesthesia, because the anesthetist and operator are bound to interfere with each other and more or less bleeding adds to the difficulties. Therefore, if one can employ an operative method that allows the operation to be finished inside of, say, five minutes (tonsil and adenoids) actual operating time, the anesthetist can stop the anesthesia at the time the operation begins. There may be other methods, but Pfister knows that at least the "Sluder" operation, or some of its modifications, make it possible to finish before the child wakes up. And in doing away with the anesthetic during the operation we have eliminated its chief danger. In this way we also, to the greatest extent, avoid the swallowing of the ether-saliva mixture and the danger of asphyxiation from a blood clot because the reflexes are reëstablished early.

The patient is placed face down immediately after the operation, and kept so afterward when in bed. It may be said here that the anesthesia has unjustly been blamed for many a death, where the actual cause was asphyxiation.

We do not hear so much now of bleeding to death after a tonsil operation, since it has been made a hospital procedure, and since surgical methods are employed to control the hemorrhage.

There are three distinct periods when hemorrhage is apt to occur in a tonsil operation: First, during the operation. With improved methods, particularly the Sluder, we do not have much fear of striking a large blood-vessel, so the bleeding is mostly from one or more small arteries, or just oozing. Prolonged sponge pressure will stop the bleeding in the great majority of cases. Tincture of iron or the compound tincture of benzoin may be advantageously used on the sponge. If not successful, artery forceps or a ligature will help, and if all these things do not work out, the placing of a small sponge between the pillars (where the tonsil was) and sewing the pillars together with two silk stitches over the sponge—the sponge to be left in for twenty-four hours—will relieve all danger of bleeding.

These measures can be used in both—the local or general anesthesia cases. The second period of hemorrhage is postoperative, starting within twelve hours of the operation, and is usually brought about by retching and by the restlessness of the patient. This is the most dangerous kind, because frequently not detected before the patient is well exsanguinated—the vomiting from the blood-filled stomach often being the first sign of alarm.

No time must be lost here with extemporizing and waiting. If pressure with iron solution on a swab and ice don't give a quick and lasting relief, anesthesia—which is well borne in the state of anemia—must be employed and surgical measures adopted as indicated before. One must not wait too long.

It is this class of bleeders for which hospital observation and care are so necessary.

The third period is between eight and ten days after the operation. Here a clot between the pillars has organized and become infected and causes bleeding when detached. Any such clot must be rubbed off when found and the surface swabbed with a solution of tincture of iron.

All the sera and other solutions supposed to favor coagulation may be employed with advantage, but the surgical methods used by the general surgeon elsewhere must and can be applied and relied on also in the tonsillar region.

TREATMENT OF CEREBROSPINAL MENINGITIS.

HILL (*Minnesota Medicine,* January, 1919) records 13 cases, all of which were cured. Every case was due to Weichselbaum's coccus, by bacteriological tests of the cerebrospinal fluid, including microscopic and cultural. In ten cases autogenous vaccines were made. The cases were of both sexes and all ages; some civilians, some soldiers; three in 1916; two in 1917; eight in 1918. The treatment was begun as soon as the cases were recognized: usually early; in some cases late; in one as late as two weeks after onset.

The outstanding features of the treatment followed were:

(*a*) Immediate lumbar puncture; for diagnosis; for relief of pressure; to secure autogenous vaccine.

(*b*) Immediate intraspinal injection of Flexner's serum, to the extent of not more than one-third the amount withdrawn.

(*c*) Immediate injection of stock meningococcus vaccine, subcutaneously.

Daily repetition of (*a*) for relief of pressure, and (*b*) for treatment: combined with use of autogenous meningococcus vaccine as soon as prepared, and thereafter at intervals of several days, as patient's condition might indicate.

With one hundred per cent recoveries, we did not dare to omit any item of this procedure; but three cases treated similarly by Major George C. Hale of London, Canada, except that the vaccine was wholly omitted, also recovered. It had been already suspected that the repeated tapping, and frequent use of small doses of Flexner's serum, were the important features. Nevertheless, some cases at least reacted vigorously to the vaccine and improvement seemed to date sharply from such reaction.

Symptoms most frequently noted were headache, vomiting, herpes, Kernig's,

strabismus, and rigidity of the neck, often not very marked, and never approaching a true opisthotonos.

For spinal puncture the patient was placed lying on the side at the edge of the bed in the knee-chest position. Skin was cleansed with alcohol; needle was inserted in the middle line between two lumbar spines nearest opposite the crest of the ilium.

In the very severe cases the patient was tapped twice daily; other cases once in twenty-four hours. At each tap sufficient fluid was removed to lower the pressure to such an extent as to get a flow of not more than 4 or 5 drops a minute (30 to 75 Cc.).

Under indications that tapping is no longer necessary are: clear fluid; negative cultures of cerebrospinal fluid; normal pressure.

In very severe cases give the serum intravenously (10 to 20 Cc.), intramuscularly (10 Cc.), and intraspinously. Can be given by all three routes at one sitting. The amount given intraspinally depends upon the amount of cerebrospinal fluid withdrawn. It has been the rule not to give more than one-third of the amount of cerebrospinal fluid removed. The author believes that the production of a negative intraspinal pressure does much to aid in draining the upper portions of the canal and thus facilitates also secretion of the spinal fluid.

The foot of the bed is raised after each intraspinal injection for the period of one hour in the hope that gravity may assist the serum in seeking a higher level.

Autogenous vaccines seem to be of some value in certain cases. As soon as bacteriological diagnosis has been made, stock vaccine up to 500 million per Cc., depending upon circumstances (age, sex, severity of infection, etc.), is given.

Autogenous vaccine is immediately prepared and can be ready for use in twenty-four hours. The author has commenced with a dose of about 100 million per Cc. and has gradually increased the dose at weekly or sometimes biweekly intervals until recovery. Three or four injections are usually all that are necessary. He alludes to two cases in the past year, which developed rather severe reactions following injections. These reactions consisted of an exacerbation of the symptoms with increased respiration and pulse rate and a condition that closely resembled convulsions. Immediately following these reactions, marked and continued improvement was noticeable.

The indications for retapping are occurrence of headache; vomiting. Usually these conditions are found to be due not to a relapse but simply to increased intracranial pressure.

Any nourishing food as long as it does not excite vomiting. Other medications recommended are simple laxatives; keeping the mouth clean; and vaselin for herpes.

A SIMPLE AND EXPEDITIOUS METHOD OF PERFORMING ABDOMINAL INCISION.

BLAND (*Surgery, Gynecology and Obstetrics,* January, 1919) thus describes the technique:

Two ordinary square gauze pads or sponges are doubled or folded upon themselves. One is interposed between the fingers of the left hand of the surgeon and the skin of the patient on the left side, and the other is interposed between the right hand of the assistant and the skin of the patient on the right side. In this manner the sterile gloved hands of the surgeon and his assistant at no time come in contact with the patient's skin. With the gauze pads in the position mentioned, pressure is made downward and outward in order to render the skin tense. A free incision of desired length is then made through the skin, superficial fascia, and fat, down to the aponeurosis. The fingers of the surgeon and his assistant then slide over the margin of the incision, having the gauze pads still interposed between the skin of the patient and the thumbs of the operator

and his assistant. This precludes the possibility of the fingers coming in contact at any step of the operation with the skin of the patient. The skin and superficial fascia and fat are now grasped between the thumbs and the fingers over the edge or margin of the incision and lifted upward. Free incision of the aponeurosis is made. The recti muscles may be separated in the median line or the right or left rectus may be split in the line of its fibers according to the preference of the operator. When the separation of the muscle is accomplished the fingers of the surgeon and his assistant slip underneath the separated fibers and raise the layers of the abdominal wall. This at the same time lifts and makes tense the peritoneum, which can now be readily incised without any danger of injuring the underlying structures.

This method of opening the abdominal cavity is performed in the shortest possible time because it eliminates the use of numerous instruments and gives very rapid access to the organs within. Furthermore, he has used it now for more than three years and has had no instance of injury to any structure since its adoption.

ACUTE PERFORATIONS OF ABDOMINAL VISCERA.

W. J. Mayo (*Surgery, Gynecology and Obstetrics,* January, 1919) observes that it can no longer be said that we are operating for perforation when we do a laparotomy on from the third to the sixth day of a generalized peritonitis. An operation, however, may be wise in order to remove a still active primary focus or secondary deposits of virulent infection, in the hope of limiting the spread of the disease. Acute perforations of the abdominal viscera then, so far as the peritoneum is concerned, may be divided into three stages: The stage of contamination, shown by more or less shock and localized pain and tenderness. This is followed by the stage of reaction; we might well say the fatal stage of reaction, because so many patients with acute perforations slip by the stage of contamination, in which they could have been safely operated on, into the stage of general peritonitis. The apparent improvement which takes place in the period of reaction leads to the belief that the patient is better. Muscular rigidity and tenderness are usually present, but may be absent in the middle-aged, fleshy man whose peritoneum has become anesthetic by reason of fat deposited behind it.

The anatomic situation of the appendix is such that the prospects of the localization of the sepsis and spontaneous recovery are usually good. Recovery, yes, from that particular attack. It is probable that not far from 70 per cent of patients with acute perforation of the appendix might recover from one attack spontaneously, but a death-rate which would exceed it, although they might have a casualty of 90 per cent. In acute perforative appendicitis we have a casualty of 100 per cent, and let us accept as probable a 30-per-cent death-rate. But such patients recovering spontaneously cannot be said to be well. The majority will have future attacks, in one of which they may not be so fortunate as in the first.

It may be said that a considerable percentage of free perforations are spontaneously closed and that the area of peritonitis is limited through natural processes; the death-rate is possibly about 30 per cent, but the 70 per cent of patients who may recover spontaneously from the attack are not cured.

An exploration through a longitudinal incision just to the right of the midline gives the surgeon an opportunity to make a careful exploration and to deal with any or all varieties of perforation.

Early operation, that is within the first eight hours, barring accident, means recovery, because the stage of contamination has not yet passed on to infective peritonitis, and measures may still be taken for the permanent cure of the condition which leads to the perforation.

Chronic conditions usually precede perforation and give ample warning of their

presence before it takes place. While this is accepted, so far as the appendix is concerned, it has not been so generally recognized that gall-stones are foreign bodies which need only infection to lead to the most wide-spread peritonitis, cholangitis, biliary cirrhosis, and pancreatitis.

Chronic ulcers of the stomach and duodenum, after a reasonable attempt has been made at medical cure, should be looked on as surgical maladies.

THE REMOTE RESULT OF TONSILLECTOMY IN THE YOUNG CHILD.

ZAHORSKY (*Interstate Medical Journal*, January, 1919) states that the immediate result of the removal of the tonsils and adenoid vegetations is often gratifying. First, the improvement in respiration leads to an increased oxygenation of the blood. Second, the removal of a large infected focus permits the body to use its defensive forces to greater advantage on smaller foci. The child often acquires a better appetite, feels stronger, and gains in weight. A subacute catarrh of the nose and throat may improve very much; a persistent otitis media may rapidly heal. These favorable effects are noted by all rhinologists, and the benefit derived from the operation has been magnified until even the layman has caught the contagion.

He offers a summary of 150 children, aged from two to twelve years, who were seen in private practice, upon whom he had endeavored to determine what effect the removal of the tonsils and adenoid vegetations had upon the health six months to five years after the operation. Deficiency of respiration was observed in 38 cases. Acute catarrhal suppurative otitis media was noted in 21 cases. Several cases of spasmodic croup were seen. Of 150 children, 49 had one or more attacks of bronchitis within four years after operation, showing that a predisposition to bronchial inflammation was not changed in a single child under eight years of age. Many of the children had had one or more attacks of pneumonia within three years following operation.

Sixteen cases of asthma were found in this series. Eleven cases of rheumatic fever were also noted; seven of endocarditis; six cases of chorea were observed; three cases of diphtheria and 15 cases with large lymph nodes in the neck. Several of the mothers stated that the children had never been well since the tonsils had been removed.

Zahorsky states that his observation shows that the child beginning his school life without the tonsils is in greater danger of acute diseases than one who still has his tonsils. It is at this age that the tonsils are so frequently removed simply because they are large; the physician apparently forgets that this enlargement is a physiological and probably a compensatory process. If the tonsils are not present, then some other part of the respiratory tract takes up the defensive activity; the nose becomes frequently inflamed and suppurates; or the bronchioles become the seat of an inflammation and muco-pus is discharged; or the lungs themselves take up the laborious fight. An acute otitis media often takes the place of an acute tonsillitis.

The tonsils are the first line of defense in the infections of the mucous membrane of the nose and throat. Clinical experience supports the view of Sonneman, that the infectious material in the nose or nasopharynx that penetrates the mucous membrane is carried to the tonsils. Here it is silently destroyed if the proper ferments are present. If immunity does not exist, the tonsil becomes inflamed and the offending microörganisms are quickly extruded, with the leucocytes and lymphoid cells, into the follicles of the tonsils. At the same time toxins and, sometimes, living bacteria enter the circulation and stimulate the production of antibodies. It is a clinical fact that an acute tonsillitis prevents the spread of a respiratory infection. The tonsil, whatever be its other functions, may be regarded as a submucous lymphatic node, and it resembles in function Peyer's patches and the solitary follicles of the intestine, which also have the function of extruding bacteria, as is observed in various forms of enteritis.

When the pharyngeal tonsils become permanently enlarged, so as to cause persistent mouth-breathing and deafness, they should be removed. When the tonsils are deeply embedded and cannot discharge their contents, and abscesses result, they are a menace to the body. When the tonsils have become scarred from scarlet fever, diphtheria, or a severe streptococcus infection, they should be removed. An infected tonsil which leads to persistent adenopathy, and does not yield to a few weeks' medical treatment, should come out. Children who have had an attack of endocarditis preceded by tonsillar infection should have the tonsils removed.

RUMINATION.

Under this title BATCHELOR and BATCHELOR (*American Journal of Diseases of Children,* January, 1919) quote the case of a baby who when free from attacks acted in a perfectly normal manner, extending her hands for everything in sight, watching those about her in an interested manner, and eagerly accepting her feedings. The child would rest comfortably in her mother's lap with her head supported against her mother's arm; or else lie in bed with her legs extended and usually crossed at the ankles, and with her arms resting beside her and so flexed that the hands were usually on a level with her shoulders. Suddenly this apparently normal baby would raise her forehead and eyebrows and, becoming rigidly extended, would throw back her head, arch her chest, contract her abdomen, and open her mouth wide. Coincidentally milk would gush up into the mouth and rhythmically rise and fall from the pharynx into the mouth for a varying number of times. While this was happening she watched observers in a disinterested manner or else gazed vacantly into space. As the attack ceased the fluid was either swallowed or lost from the mouth. The child then breathed deeply, made a few chewing movements, and again acted in a perfectly normal manner. These attacks were so typical of rumination as to leave no doubt as to the diagnosis.

The attacks came with an almost definite regularity, from eight to ten minutes after the beginning of a feeding. If food was given sufficiently fast so that all of it was taken within this interval of time, the child would be free from attacks while being fed; if feeding extended over a longer period, the child, whether at the breast or the bottle, would suddenly throw back her head and ruminate. Rumination continued for two to two and a half hours after a feeding, the attacks coming more frequently during the first part of this period and less frequently toward the end. On an average fifteen attacks occurred during the first half-hour, and from fifteen to twenty attacks during the following one and one-half or two hours.

Rumination is naturally divided into three parts: regurgitation; rumination proper—that is, the working on the regurgitated food in the mouth and pharynx; and reswallowing. The last needs no discussion, inasmuch as there is no reason to believe its mechanism to be other than that of normal swallowing. Regurgitation must be similar to vomiting—a propulsion of the stomach contents into the mouth. In the rigid opisthotonic position which the child assumed, the abdomen was held contracted and the musculature was felt to be tense.

It was found that closing the jaw prevented the attacks, on which advice a night-cap was built with three pairs of tapes leading from it; these by being tied under the chin were the means of holding up the lower jaw. Tapes were found to work better than a comfortable chin pad because of the discomfort they caused when she attempted to pull against them. Because of this discomfort she grew less persistent in her efforts to work loose the cap. In using the cap the child was fed rather rapidly, so as to prevent attacks occurring during her feeding, and then the cap was put on quickly and the tapes tied tightly under her chin. It was necessary to have the cap securely tied so that it could not

be worked off by head movements. With the tapes tight it was impossible for attacks to be initiated, so that no rumination occurred.

Under this treatment the child was cured after a period of two weeks. Cases of rumination are reported in the last three years as seen in the Harriet Lane Home. The literature of the subject is well traversed, nor do these studies throw any light as to the underlying etiology.

SUNSTROKE OR HEAT-STROKE.

FINNY (*Indian Medical Gazette,* October, 1918) considers it advisable that the body should be protected from the actinic rays by dark-colored underwear, or dark lining to outer garments, which should be light in color to permit reflection.

Though thick, dark hair is probably sufficient protection for the head, for those not endowed with this a felt hat with a dark lining makes a suitable substitute.

In the case of young fair children, whose skulls are often practically transparent, a light but thick "topi" may be advisable.

The eyes should always be protected from direct sunlight unless of a dark color. This may be effected by having a broad-brimmed hat.

When there is much glare from reflection, as is the case in most Indian cantonments, dark glasses are a comfort, and will probably prevent the majority of cases of sun-headache.

The head may be protected against moderate degrees of heat by a felt hat. This also applies when playing games like tennis, when the extra perspiration induced helps to prevent local rise of temperature of the skull.

When the heat of the sun feels intense—and this only occurs in the hot weather, when the shade temperature is high and there is no breeze—a thick Cawnpore topi should be worn.

During intense hot weather, particularly when there is a high percentage of moisture in the air, there is always a risk of heat-stroke.

Exposure to the noonday sun should be avoided as much as possible, but if unavoidable, clothes should be as light and loose as possible and the topi should be broad and furnished with a "cabbage-leaf" extension, which protects the shoulders.

Though an undervest, which is often regarded in India as a necessity, may help to prevent chills at sundown, there is no question but that it limits loss of heat, and so should be avoided in the heat of the day.

Alcohol should be avoided before sunset. When the sun has disappeared it is customary to take a small quantity of whisky, well diluted. Though under these conditions it is unlikely to harm a healthy individual, it can do no good physically, and in a patient threatened with heat-stroke is harmful.

As the evaporation of perspiration is the only means available for keeping the body temperature normal, when the temperature of the air is above it, free perspiration is essential. It is no uncommon thing for a man to lose eight or ten pints of fluid in this way, so that the ingestion of considerable quantities of liquid is not a luxury but a hygienic necessity.

The use of spine-pads appears to be based on the assumption that sunstroke is caused by the sun striking on the spine.

The writer has been unable to find any scientific, experimental proofs in favor of this theory, and several have been adduced against it. If the spinal cord is vulnerable, it must be in the important centers situated at its origin. A well-made topi covers both the head and the back of the neck, so that a spine-pad is unnecessary, and, from the fact that it may interfere with loss of heat, may be positively dangerous, but a narrow strip of dark-colored silk sewn inside the coat does no harm, and may give a sense of security to its wearer.

From a review of the foregoing precautions, which are not theoretical, but are based on experiment and observation, the extremely practical deduction is arrived at

that, except in the case of young children, one is justified in trusting one's sensations; thus, when the sun has just risen, when it is behind a thick cloud, or when the weather is cold, no hat is necessary, but when the sun's rays are beating down with tropical fury, one instinctively seeks protection from them, and this is the time when a large, cool topi should be worn.

DIAGNOSTIC DEMONSTRATION OF SPIROCHAETA PALLIDA.

GOODMAN (*Interstate Medical Journal*, January, 1919) gives an excellent description of the method of determining the presence of the Spirochæta pallida by means of the dark-field apparatus. Finding of these organisms is positive proof of the existence of syphilitic infection. It is, however, true that many typical chancres give hours of fruitless labor in the attempt to demonstrate the offending but baffling spiral. If a lesion is clinically sufficiently suspicious to warrant the hunt for the Spirochæta pallida, the non-demonstration should not give the patient a clear bill of health. Repeated searches should be undertaken, the local applications being of a cleansing nature only. The Wassermann test should be taken at weekly intervals for at least seven weeks, and, if only even slightly positive from reports of a well-controlled laboratory, treatment should be instituted. The clinical evidence of four hundred years' study of this disease should not be cast adrift in the face of the newer discoveries, and clinical chancres are still chancres. It is well-nigh criminal to wait for the secondary manifestations, since even with the most persistent treatment begun at this period the chances of cure are many, many times diminished.

Any patient with a lesion that the mature examiner declares is a primary lesion of syphilis should be treated intensively, whether the dark-field illumination reveals the Spirochæta pallida or not. Its demonstration is of value. It makes an absolute diagnosis, and is confirmatory of clinical judgment and knowledge. It has taught us that many erosions and so-called soft chancres harbor this scourge of the race. The method should be used often—it should be used universally.

Condemning testimony must be given against the easier Burri india-ink method of demonstrating spirochetæ.

The objections are numerous. Among others, mention is made of the greater difficulty of finding in even a well-made smear a still object as compared to a motile one. In cases in which the lesion has few spirochetæ the india-ink method is far inferior. The making of the smear and changes in osmotic pressure so contort the spirals that the task of differentiation of pathogenic and non-pathogenic spiral organism is increased. At this time the impossibility of securing the foreign Chin-Chin puts this method beyond the pale of good usage; the only substitute, a commercial india ink, already contains spiral organisms or spiral-like artefacts.

Other staining methods are open to the same objections as the above, excepting the prior presence of some spiral forms, although the precipitated stain does take some astonishing confusing spiral-like forms.

Cultural and animal inoculations are not practical diagnostic methods.

TWO HUNDRED AND FIFTY MAJOR OPERATIONS UNDER LOCAL ANESTHESIA.

WIENER (*Medical Record*, Jan. 25, 1919) reports on 250 major operations done under local anesthesia. He begins with a preparatory dose of morphine three-quarters of an hour before operation, which may be repeated; uses a 1-per-cent solution of novocaine or of apothesine, to an ounce of which five or six drops of a one-to-a-thousand solution of epinephrin are added. He states that an ounce of the anesthetic solution usually suffices for a herniotomy or appendicitis operation. He first makes a skin infiltration, then makes his incision through it, and infiltrates the deeper tissues as he proceeds with the operation.

He states that in the 115 cases of acute and chronic appendicitis there were two deaths. For his herniotomies he uses the anesthesia in all layers of the abdominal wall, making no effort to block the nerves. As to the time consumed in operating, the author states that including both the acute and chronic cases of appendicitis the average time was twenty-two minutes. His cases included cholecystostomy, cholecystectomy, gastroenterostomy, radical removal of the breast for carcinoma, many procedures usually regarded as requiring the administration of a general anesthetic.

THE MUCH-NEGLECTED FINGER FRACTURE.

HOPKINS (*International Journal of Surgery*, January, 1919) on the basis of a large industrial experience calls attention to the importance of a proper conception as to the means of restoring to prompt functional activity patients who have suffered from fractured fingers. He gives some interesting *x*-ray plates showing the unfortunate results incident to the routine method of treating these fractures by placing the finger upon a short straight splint. He advises, before dressings of any kind have been applied or any attempt at reduction has been made, skiagrams in both directions to ascertain the character and location of the fracture. After this has been done the hand should be placed upon a well-padded roller bandage splint long enough to reach across the palm, so that all of the fingers can be immobilized for the purpose of acting as lateral splints to secure the proper position and alignment of the injured finger. The splint should be first well fixed in the palm by wide adhesive strips placed lengthwise and carried over the dorsum of the hand. The fractured finger should then be strongly flexed around the splint with an adhesive strip passing from the wrist forward over the injured finger and splint, and well back upon the forearm. The other fingers should be immobilized in the same manner, especial care being used to see that all of the fingers are in normal line with relation to each other, as otherwise there may be some lateral angulation at the point of fracture. The hand should then be well dusted with powdered boric acid or some other good dusting powder, with strips of gauze or cotton placed between the fingers to prevent maceration. The hand should be padded with cotton and dressed with a well-fitting roller bandage. The thumb may be left free if uninjured. The dressing should be allowed to remain in place, undisturbed, for at least two weeks, when it can be carefully removed, the skin cleansed, and the other fingers manipulated and massaged. The same dressing should then be reapplied for another week, again removed, and mild passive motion made of the injured finger. At the end of the fourth week all dressings usually can be removed entirely, the hand being used with care for another week. In practically all cases of this kind such a method of treatment will bring about a perfect result, allowing the patient to return to his work at the end of the sixth week. This will be about one to two weeks longer than the time needed for a fracture of the middle or distal phalanx, but experience has shown that this length of time is necessary.

The middle phalanx should be treated with either a straight palmar or dorsal splint, but the mistake should not be made of having the splint merely the length of the finger, allowing the hand to be used during healing, but it should be carried well back and fixed at the wrist with adhesive plaster, which should also be carried around the hand. After this fixation at the wrist and hand a sufficient degree of extension should be made and the finger immobilized by passing wide adhesive strips above and below the fracture, well padded, and dressed with a bandage.

The usual straight splint, if proper reduction is made, is all that is necessary for the distal phalanx.

Unfortunately, the deformity in fingers is not discovered until all splints have been removed and prolonged effort has been made to reëstablish function, by which time

the callus is firm and it is too late for refracture by ordinary means. Most frequently when these cases are referred to another doctor for the purpose of correcting the deformity, the patient is informed that it is too late to do anything except to amputate. These fingers can be restored to their normal position and function by a very simple but delicate operation. It should always be done under general anesthesia, as there should be absolute relaxation with not the slightest degree of resistance by tendon contractures, and this cannot be obtained by local anesthesia. An incision should be made on each side of the proximal phalanx along its entire length. The tendons should be lifted and wide strips of tape carried under them and held by one assistant, thus keeping them out of the operative field. The hand is then turned so as to rest upon the ulnar side, the other fingers completely flexed and held by a bandage. A tight roller bandage, standing on end, should then be placed under the finger which is to be operated upon, giving support immediately under the fractured phalanx. The deformity can readily be felt and seen, when the fragments should be separated at the point of union with a narrow artist's chisel, tapping with a light hammer. The ends of the fragments should now be freshened and drilled, a loop of fine silver wire, kangaroo tendon or heavy catgut passed through the drill holes, and the freshened ends drawn together in proper alignment. The tendons are then dropped back into place and the skin sutured with fine catgut. A roller-bandage-splint dressing should be applied as in a recent fracture.

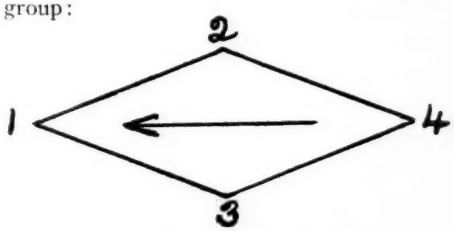
The dressing should remain in place after an operation of this kind for at least four to five weeks without being disturbed, as it necessarily takes longer for the second union to become firm. This is on account of the lack of normal blood supply and lowered tone of the soft parts, and always a degree of osteoporosis, due to the long disuse following the initial injury.

Occasionally the marked degree of osteoporosis will cause a complete failure of union and the finger has to be amputated at the point of fracture, but even then the patient is relieved of a troublesome member and he is no worse off than before the operation. The attempt to restore such a finger, however, is worth the effort.

BLOOD TRANSFUSION.

BUCHTEL (*Colorado Medicine*, January, 1919) states that transfusion is never so urgently demanded that an unknown blood should be used. The donor should belong to the same blood group as the patient. If it is impossible to get such a donor, then one should be selected whose corpuscles are not agglutinated by the serum of the patient.

This design is offered as an easy way to remember what donors to use in case it is impossible to secure a donor of the same group:



Transfuse in the direction of the arrow. That is, a group 4 donor may be used to transfuse blood to a group 1, group 2, or group 3 patient; while a group 2 or group 3 donor may only be used for transfusion to a group 1 patient.

A group determination can be made in ten minutes in the majority of cases. One must have on hand a known group 2 serum and a known group 3 serum in order to make a quick test. These sera are kept in sterile bottles in the ice-box. They are also kept dried on cover-slips in the ice-box. To determine an unknown group a few drops of the unknown blood are suspended in one cubic centimeter of one-and-one-half-per-cent sodium citrate in nine-tenths per cent salt solution. A platinum loopful of this solution is placed on a cover-slip with two loopfuls of the known 2 serum, and after

shaking a little is examined as a hanging drop with the microscope. A loopful of the unknown blood suspension is also in like manner examined with a group 3 serum. A glance at the table appended shows the correct classification of the unknown blood.

		Cells.			
		1	2	3	4
Serum	1	0	0	0	0
	2	+	0	+	0
	3	+	+	0	0
	4	+			0

The crosses indicate agglutination; the ciphers no agglutination.

A mistake in this test is such a serious error that the authors always use several known sera with the patient's cells, and also ordinarily test certain known cells with the patient's serum.

Some bloods have very weak agglutinins and some have no agglutinins. The group determination of the blood is not complicated, but it requires very painstaking laboratory work and an enormous amount of patience.

For the person who does only an occasional transfusion and who has on hand no known sera, the determination of the group can be evaded and yet a proper test be made by testing the cells of the recipient with the serum of the donor and the donor's cells with the recipient's serum. If there is no agglutination in either test the two bloods belong to the same group. If there is no agglutination of the donor's cells by the recipient's serum it is safe to proceed with the transfusion even though the recipient's cells are agglutinated by the donor's serum.

If all the methods but one had to be abandoned the citrate method should be the one retained. It is the easiest to learn and can be used by the doctor who gives only an occasional transfusion. The one great objection is that about two out of three patients have a chill following the transfusion. The chill is of citrate origin and so far no way is known to prevent it.

It is the method of choice in private homes, for acute hemorrhages, for transfusion into the superior longitudinal sinus in babies, and for the occasional operator.

The author reports 100 cases of transfusion. He considers the method indicated in pernicious anemia because the patients are given a remission, and their lives are prolonged. The cases with a low white cell count, and especially those with a low polymorphonuclear count and rather high lymphocyte percentage, indicating exhaustion of the blood-forming organs, are the patients that receive the least benefit from the transfusions.

Cases of purpura with bleeding from the nose, throat, gums, lips, uterus, kidneys, and with great subcutaneous ecchymoses and purpuric spots and with a blood platelet count as low as 3000, have been restored to health. The results are so brilliant that this disease will soon be removed from the list of incurable affections.

The cases of hemophilia have all been of the acquired variety, and the bleeding has been checked by one transfusion. Three transfusions for hemorrhage of the newborn are included in this group. Transfusion can be depended upon to cure this disease in a very high percentage of cases.

Of the fourteen transfusions for acute hemorrhage there were three deaths. The two placenta previa cases died of sepsis; both were county hospital cases. One was delivered by version and one by Cæsarian section. Both were packed before admission to the hospital, under adverse conditions in poor homes without any conveniences, as reported by the two physicians who attended the patients before sending them to the hospital. Neither of the patients died from hemorrhage, but from sepsis many days later. The hemorrhages in the typhoid case ceased after one transfusion. The patient died two weeks later from his disease.

There is a great field for transfusion in preparing patients for operation. Seven of the eleven patients in this group could not have been operated upon at all without the transfusion. All the patients stood their operations well.

The septicemia cases all died and were not even improved by the transfusion. The

one patient transfused for shock died. The transfusion did no good. Shock associated with hemorrhage or due to hemorrhage is relieved by a blood transfusion, but where the condition is pure shock transfusion is not indicated.

PROSTATIC CALCULI.

JUDD and CRENSHAW (*Minnesota Medicine*, February, 1919) observe that cases of prostatic calculi may be divided into three distinct groups. In two of these groups the cases were those of true prostate stones as they are formed immediately within the substance of the gland; in the third group the stones are formed elsewhere, usually in the kidney, sometimes in the bladder, possibly in a diverticulum of the urethra, and are passed into the prostatic urethra. These are known as false prostatic stones. In group 1 the authors placed the cases of true prostatic calculi, in which the stones were the result of peculiar forms of prostatitis. There may be one or a number of stones formed at the same time. They evidently arise from the acini or ducts of the gland, and while they are usually small, they may attain to considerable size. These calculi have the concretion and sediment of the prostate gland as a nucleus, and this is usually covered by layers of phosphates. There may be some urates as well in the formation, but the nucleus is considered the distinguishing feature. Examination of the nucleus for prostatic material will definitely determine whether or not the stones were formed within the prostate gland. Regarding the formation of such stones, Lund says that hard, microscopic bodies called corpora amylacea form in the prostate at any age. They consist of sediment from the prostatic secretion, and at times become the nucleus for stone formation. Mineral salts, chiefly phosphate of lime, the triple phosphates and bicarbonate of lime make up the outer coat. The presence of stones in the gland, and also the presence of inflammation in the gland, cause considerable absorption and destruction of gland tissue, so that it is usually but a honey-combed formation with calculi projecting from the different compartments. Often there are also multiple abscesses. Unquestionably, prostatitis is the important feature, and stone formation is probably secondary. While the stones are generally distributed throughout the gland, they may occur in isolated pockets outside the gland proper, and some cases are reported in which the stones were located in pockets in front of the rectum and were removed by incision into the wall of the rectum.

The symptoms are those of a severe prostatitis, and often the patient is treated for the inflammation, unaware of the fact that stones exist. If the stones project into the urethra, there will usually be urinary obstruction. In some of the cases stones have passed through the urethra, and sometimes there is a history of hematuria, though these features are not at all diagnostic. The diagnostic characteristics lie in the feel of the gland on rectal palpation and in the shadows shown in *x*-ray examinations of this region. Frequently the condition can be definitely diagnosed by palpation, as the stones may be felt and there is a sense of crepitation on pressure. If the stones are well buried in the gland substance or are lying in the prostatic urethra, they may not be felt. Practically all such stones will cast shadows on *x*-ray examination. It is important that an *x*-ray examination should be made in all cases of protracted or uncertain prostatitis.

Special mention should be made of the differential diagnosis between prostatitis, hypertrophy with stone formation, and carcinoma of the prostate. Sometimes the differentiation is quite difficult in that the hard nodular prostatic carcinoma presents much the same sense of feeling as the stones. In such cases the cystoscopic examination may be very helpful in settling the diagnosis, as in the event of prostatitis it reveals the dilated prostatic ducts, and often the stones will be seen projecting from them. Tuberculosis of the prostate may at times simulate prostatitis with stones, but

more often the differentiation is not difficult. An *x*-ray examination may be necessary in order to differentiate the conditions, and it is essential that the exposure should be made low enough to take in the pubic symphysis.

The treatment of all types of prostatic calculi is to remove the stones and remedy the accompanying condition. In cases of true prostatic calculi, in which there is usually a severe prostatitis, the authors believe that treatment should be radical. In some instances the condition can be relieved by massage and irrigation, the stones being forced into the urethra and washed out. However, continuing this treatment over any length of time is not justifiable, and if the stones are not easily removed an open operation is indicated. Some surgeons have advised, as an operative procedure in these cases, a perineal prostatectomy, and scraping out the stones and draining the infected prostate. Under ordinary circumstances it is preferable to do a transvesical operation. In this way we are more certain to preserve the bladder sphincters intact, and also in many of the cases the prostate will be so extensively infected that the greater part of it should be removed to insure a complete cure and to prevent a return of symptoms. In many instances the prostate is so completely destroyed that it must have lost all its function; it is of no service, and may make trouble in the future. It is not necessary to operate especially to remove the sandy material which is always found in conjunction with some hypertrophy of the gland, but when this condition complicates a hypertrophy it is well to be careful to remove all of the sandy material from the prostatic capsule. This can be done easily after the enlargement has been enucleated. Where false prostatic calculi pass down the urethra and can be removed by the cystoscope or other urethral instruments, this should be done, but if they are firmly wedged into the urethra, it will be best to remove them by transvesical operation.

Prostatic calculi are in reality complications arising in cases of prostatitis, hypertrophy of the prostate, and kidney and bladder stone. While they are rare, they are common enough, all cases considered, to command considerable attention. By bearing in mind that calculi may complicate any one of these conditions, that with the present methods of examination they may be recognized, and furthermore that the treatment of the condition is generally entirely satisfactory, we should be able to add a great deal to the relief of patients suffering from prostatic calculi.

GUNSHOT FRACTURES OF THE FEMUR.

MASSIE and SWANSON (*Journal of the Royal Army Medical Corps*, January, 1919) report on 155 cases of gunshot fracture of the femur admitted between January 1, 1918, and August 1, 1918. Of these 22 died. There were 21 cases of gas gangrene, and in 14 the knee-joint was involved. In 35 there were other wounds. Out of the total number there were 15 amputations. Of 21 fatal cases 13 were due to gas gangrene. The average shortening was 6 mm., or about one-fifth of an inch. The fracture is usually greatly comminuted. Extension was found useful in all cases, with the limb in a position of abduction; and semiflexion of the hip and flexion of the knee. The modification due to muscle destruction was usually in the direction of minimizing the tendency to displacement after reduction had been effected. All types of fracture may be treated with apparatus described, and the treatment should result in a limb of normal length and contour excepting when the damage has been so gross as to cause total destruction of a large part of the bone and periosteum. There is provided an adjustable vertical suspension pole from which projects an extension pole parallel to the long axis of the bed. These extension and suspension poles are readily adjustable by two beams running the entire length of the ward. The suspension poles are notched to prevent any slipping. The extension pole

is perforated with holes two inches apart through which the cord of the pulley block is secured. Thus it becomes possible to apply a pulley from any point, in any direction, and of any weight which may be required to reduce the fracture. This system can be readily adapted to any type of pulley and any type of splint. The most useful splint for all fractures of the femur is a medium ring Thomas splint. This enables the surgeon to retain the fragments in absolute apposition once the fracture has been aligned. The patient may be dressed or even operated upon without extension being removed. The only fractures in which it is not successful are those in which there are high buttock or perineal wounds. In these cases a Sinclair net bed comes into play, readily suspended from a suspension bar. For these high wounds a section bed and a double abduction apparatus is often serviceable. Hodgen's splints are useful in some high fractures, but possess the disadvantage of rendering the fragments mobile when the upper slings are removed for dressing purposes.

The vast majority of cases are forwarded from the Casualty Clearing Station with strips of adhesive plaster or gauze glued and bandaged to the limb for the purposes of extension. This answers well for transport.

Glue extension has, however, the disadvantage of frequently producing blistering and occasionally sloughing of the skin, even when the greatest care is exercised in its application. The authors prefer the caliper extension applied to the condyles of the femur, but do not use them where there are wounds in the lower third of the thigh on account of the difficulty in maintaining asepsis. They should be introduced through a small punctured wound made with a tenotomy knife to effect a water-tight junction at the point of entry of the caliper. Caliper points should not be sharp, nor should they penetrate the bone to a greater depth than one-sixteenth of an inch. When embedded to this depth there is no possibility of the caliper slipping.

The caliper may be left *in situ* for six to ten weeks, and in some cases longer. Pressure should at no time be exerted upon the perineum by the ring Thomas splint. This should bear on the tuber ischii and pressure need at no time be exercised on the perineum.

The system is practically painless and permits of passive movement of the knee-joint, thereby eliminating any tendency to ankylosis.

In the larger number of cases treated by caliper extension, sepsis at the site of application of the instrument has been of rare occurrence, and was slight and easily controlled after removal of the caliper.

Where the caliper cannot be used over the condyles, where glue extensions have been unsatisfactory, the calipers can be inserted into the os calcis one inch below the external malleolus. Extension in the direct line of the femur is obtained by the resultant force.

The authors do not favor transfixion pins, but believe that in a small percentage of cases this is advisable. The picture of the means of securing and maintaining apposition will not appeal to the American surgeon because it is so clumsy. When the suprapatellar pouch is involved in the wound an effort should be made to shut off the knee-joint by means of excision and suture of the damaged synovia.

In all cases of involvement of the knee-joint traction must be applied below it. Otherwise ulceration of the cartilage and subsequent ankylosis follow. The sciatic nerve may be involved. If this is accompanied by extensive muscular damage, the case is best treated by early amputation. The same holds true in regard to the femoral artery if severed.

Gas gangrene of a septic type was frequently observed. General symptoms precede the designating local ones. Immediate amputation is the only hope, and if delayed after local signs are present offers practically no chance for even that operation. Where six inches or more of the shaft have been destroyed the limb should be amputated, since even if successful conservative measures are adopted the orthopedic result

is not worth the risks to which the patient must be exposed.

The spread of sepsis may usually be checked by efficient and dependent drainage, but may assume the form of an acute cellulitis, which may be so severe as to leave no option but amputation. Abscess formation, due to the spread of sepsis along the intramuscular planes, is of frequent occurrence, and is met by suitable incision and drainage.

Secondary hemorrhage calls for immediate ligation of the vessel above and below the site of injury or ulceration, and the ligature material should be strong chromic catgut.

When amputation has been decided upon, the anesthetic of choice is either spinal anesthesia or gas and oxygen. When these are used there is no shock throughout the operation. In spite of the choice of anesthesia an initial fall of blood-pressure is observed within, as a rule, the first ten minutes after administration. This is adequately counteracted by the injection of intravenous saline, or citrated blood. There is, of course, a complete absence of pulmonary sequelæ.

All these cases of fracture should be treated by primary operation, and this promptly. The wound of approach should be a very large one. All loose fragments should be taken away at that time. The French surgeons have strongly advocated a subcutaneous esquillectomy. Ordinarily, having established efficient drainage, the wounds are lightly packed with gauze, but in heavily infected cases continuous irrigation is used.

No confidence is expressed in antiseptics, and dependent drainage is regarded as much better than the Carrell-Dakin. In the later stages of wound treatment, when the sepsis has to some degree subsided, brilliant green is found to stimulate the process of repair.

The functional value of the limb is entirely dependent on the anatomical result obtained; hence the aim in every case is to reproduce as nearly as may be the original anatomical form.

It is important to preserve the anterior curve of the femur. This may be done by the careful adjustment of the slings and extension weights controlled by frequent resort to the *x*-ray. The fragments should be carefully aligned as early as possible since the regenerative function of bone begins a few hours after injury. The practice of the authors is to extend the limb until one-quarter of an inch over-length has been secured. This allows for a slight subsequent contraction which very often follows after union has taken place.

PYORRHEA ALVEOLARIS.

McNULTY (*Boston Medical and Surgical Journal*, Feb. 13, 1919) states that alveolitis dentalis—interstitial gingivitis—is an error of metabolism focusing its expression in and about the alveolus dentalis. Being basically a nutritional disease its treatment should be systemic, supported coöperatively with necessary and proper surgical technique—thorough instrumentation.

Alveolitis dentalis—interstitial gingivitis—is, in the light of present knowledge, due to the same cause that induces irritation, inflammation and suppuration in other tissues of the animal organism. The cause is now believed to be lowering of "concentration and velocity of reaction" of the body autoprotective mechanism; that is, internal secretion and enzyme insufficiency, or hypoaction of the pituitary, thyroid, suprarenals, gonads, and the enzyme cycle.

Nutritionally considered, there would not occur interstitial gingivitis, resulting in a pus flow (pyorrhea) and loss of tissue, if the structural tissues were not lowered in resistance. Physiologic tissue resistance is, in the light of present understanding, due to normal supply and normal rate of reaction of the associated activities of internal secretions and enzymes constituting the "body autoprotective mechanism."

Saline balance is essential to body well-being—physiologic equilibrium; and a disturbance in the salt balance may be an important contributing causative factor in the

nutritional error called interstitial gingivitis. We are in the habit of thinking and speaking of calcium deficiency or calcium disbalance, but it is probable that other resident salts, particularly potassium salts, have much to do with physiologic equilibrium—the rôle of the potassium salts is to aid in the oxidation and elimination of protein toxic radicals and waste.

Whole cereals are rich in available nutrient salts. Available salts—nutrient salts in a condition for physiologic appropriation—are made available only through physiologic analysis and synthesis; the administration of these salts from without, as inorganic salts, is not subject to appropriation—assimilation. The administration of calcium salts does not effect the quantitative utilization of calcium except to the extent that they, as catalysts, activate or aid organic synthesis of available nutrient calcium. Therefore, calcium, or any of the proximate salts essential to body well-being, should be supplied through proper food.

Surgical technique or instrumentation is an important and essential part of the treatment of alveolitis dentalis. This technical instrumentation is solely the province of the properly equipped and efficient dentist. However, in the treatment of this error of metabolism there is no separating line between the physician and dentist, as its successful management depends on the efficient coöperation of both physician and dentist.

BLOOD VOLUME.

As the result of carefully conducted research on this subject ROBERTSON and BOCK (*Journal of Experimental Medicine*, Feb. 1, 1919) summarize their work as follows:

Blood volume tests made on a number of soldiers recovering from hemorrhage have shown that in many instances dilution of the blood occurs very slowly. The principal reasons for this seem to be an initial lack of reserve fluid of the tissues, and the absence of any subsequent attempt by the body to make up this fluid deficiency.

By putting such patients on a large fluid intake by mouth and rectum it has been found that their blood volume can be promptly and greatly increased. Hemorrhage cases transfused, yet still showing a low blood volume, were first treated in this way. Then the effect of forced fluids without transfusion was tried. Immediately after a hemorrhage, or as soon as the patient came under observation, he was given large quantities of water by mouth, and salt solution by rectum. Under such treatment the blood-pressure soon began to show a progressive rise, the volume increased, and the red cells became more evenly redistributed, as shown by the relative hemoglobin percentage of the capillary and venous blood. These changes were often well marked after only two or three hours of the treatment.

More than this, forcing fluids in cases in which the amount of bleeding is difficult to estimate on account of the presence of a high hemoglobin percentage is of distinct value, since the dilution of the blood which results serves to show the extent of the hemorrhage through the drop in hemoglobin that it entails.

In attempting to determine the condition of the patient after hemorrhage with a view to deciding the most suitable form of treatment, it is of much importance to learn the total blood loss—which is often not even indicated by the hemoglobin concentration of the remaining blood. With a total hemoglobin reduced to 25 per cent or under, transfusion is needful. New blood is necessary, not only to supply more oxygen-carrying cells, but also because it actually enables the circulation to increase its volume. For, as has been pointed out, the hemoglobin percentage must be above a certain point if a rapid restoration of the blood volume by means of the organism's own activities is to come about. With the total hemoglobin above 25 per cent the chief need is for increased blood volume, and if the patient's condition demands an immediate and large addition of circulating fluid, gum acacia solution should be given. If the condition is not so urgent, forced fluids by the alimentary tract are indicated.

The blood volume can be considerably

reduced and yet a normal blood-pressure maintained. It is pointed out that the vasomotor mechanism which has adapted itself to the diminished blood bulk may in any individual case be very near the margin of its compensatory power. Increased strain in such instances may cause a failure of this mechanism with a resulting fall in blood-pressure.

The beneficial results of forced fluids after secondary hemorrhage suggest the value of the early use of fluids by the alimentary tract in cases of primary hemorrhage.

REVIEWS.

LICE AND THEIR MENACE TO MAN. By L. L. Lloyd, R.A.M.C. (T.), with a chapter on Trench Fever by Major Biam, R.A.M.C. Oxford University Press, London, 1919.

The author of this book is the chief entomologist of Northern Rhodesia. He tells us that it is for the general reader, rather than for the specialist, and is designed to bring before him the main facts, concerning the lice of man, which have been brought to light in the last few years. He thinks that while the body louse lives in closer association with man than any other insect, it is still a subject of much erroneous information. The great war has served to emphasize the importance of studying its habits and its importance in the dissemination of disease. All too frequently heretofore the louse has been an object of loathing and a symbol of filth, but now its presence is recognized as a very real danger to the community.

The book contains about 130 pages, and after an introductory chapter deals with the structure of the louse, its life history, and habits, its method of dissemination, the measures to be used in getting rid of it, the migration of body lice and its importance in typhus fever and trench fever.

CLINICAL MICROSCOPY AND CHEMISTRY. By F. A. McJunkin. Illustrated. W. B. Saunders Company, Philadelphia, 1919. Price $3.50.

The author opens his book by pointing out that there is little uniformity in regard to the place and scope of those laboratory methods which are employed by the physician in medical schools, and complains that too often the instruction is of the laboratory type in the sense that it has not sufficient bearing upon the problems which the practical physician will have to deal with. In other words, the endeavor of the author has been to prepare a book which will not only be useful to the laboratory worker who does nothing else, but to the practicing physician as well.

The illustrations are, most of them, excellent. The type is large and well spaced, and details are given as to exactly how the physician should proceed, first, to obtain his material, be the subject living or dead; then what he should do in the way of preparing it for examination. Last of all, advice is given as to how the material should be examined and the conclusions which should be reached. This, it will be observed, is a pretty large contract, for a book which covers less than 500 pages of large, wide-spaced type, but we think it fair to state that the author has succeeded in the task which he set before himself.

A TEXT-BOOK OF PATHOLOGY. By Francis Delafield, M.D., LL.D., and T. Mitchell Prudden, M.D., LL.D. Eleventh edition, revised by Francis Carter Wood, M.D. William Wood & Company, New York, 1919. Price $7.50.

Delafield and Prudden's Pathology may be said to be to Morbid Anatomy and Pathology what Gray's Anatomy long since became in relation to that department of medical science. To say that a book which has reached its eleventh edition, which was written by such eminent pathologists and brought up to date by a worthy successor, is a standard work is expressing the matter too mildly. Indeed the reviewer finds it difficult to use words which sufficiently express his admiration of the thoroughness with which the various subjects are discussed, the excellence with which the illus-

trations are produced, and the close contact the authors maintain between pathology and morbid anatomy on the one hand and clinical medicine on the other. Some authors on special subjects seem to ignore the fact that general practitioners have any interest in their theme. One of the peculiarities of this work from the first has been that Dr. Delafield, being an active practitioner, placed upon its pages the imprint of the successful clinician, and so for many years we have employed each succeeding edition as our guide from week to week when we wished to have information dealing with pathological questions in connection with living patients, feeling confident too that if a patient eventually came to autopsy, that in these pages there would be found illustrations and words which would throw definite light not only upon the case at issue, but upon future cases.

Without being burdened with an excess of references a very large number are given in the form of foot-notes, and practically all of them refer to the standard or leading articles which are being considered.

The book now contains 1354 pages including the index, which by the way is not an index only of subjects, but of authors. This volume is a credit of the highest type not only to clinical but to scientific medicine as it exists in the United States.

ULTRA-VIOLET RAYS IN MODERN DERMATOLOGY. By Ralph Bernstein, M.D. Achey & Garrecht, Lancaster, Pa., 1918.

The Professor of Dermatology in the Hahnemann Medical College of Philadelphia states that the efficacy of ultra-violet rays in the practice of dermatology is now thoroughly established, and tells us that he has been prompted to write the text because no American author has heretofore attempted to so write, the profession relying entirely upon the writings of their European colleagues. This information causes us surprise.

After describing what the ultra-violet rays consist in and the various lamps which are used by dermatologists, he discusses the different cases in which he believes these rays to be useful, and toward the close of the book devotes himself to their clinical application by writing brief articles on various skin diseases and giving very definite directions as to exactly what shall be done. Thus in Lupus he tells us how the Alpine sun lamp is employed and gives directions as to the distance from the disease at which the lamp should be placed, the time of exposure, and the frequency of treatments, thereby giving a very clear idea, as far as it is possible to do this in a written text, of exactly what the author himself would attempt should such a case present itself for treatment.

SURGICAL TREATMENT. By J. P. Warbasse, M.D. Volume III. W. B. Saunders Company, Philadelphia and London, 1919.

The third volume is devoted to the treatment of Hernia, the Rectum and Anus, the Vermiform Appendix, the Liver and Gallbladder, the Genito-urinary Organs, the Upper Extremities, the Lower Extremities, Plastic and Cosmetic Surgery, Electricity, Radiation and Surgical Treatment, the First Stage of the Injured, Bandaging and the Economics of the Surgical Treatment.

There is a useful appendix on surgical materials, instruments, anesthetics, the preparation for operation, closure of wounds, foreign bodies, infected wounds, open wounds, wound complications, syphilis, blood transfusion.

The section devoted to Hernia is preceded by a brief but satisfactory discussion of the trusses in common use. The illustrations of this section, and indeed those of the entire book, are excellent. It is worthy of note that the method of treating femoral hernia through the inguinal canal is mentioned though not described. This is an operation which will probably be universally practiced for this type of hernia.

The section on the Rectum and Anus is preceded by a brief anatomical description, and thereafter follow abundant illustrations of procedures; in the main those of choice. There is a very complete section on Appendectomy, the McBurney approach

being rightly given preference. The Operations on the Liver and Gall-bladder are considered from the standpoint of the man occasionally called upon to operate on these organs. There is included here a section on Reconstruction of the Common Duct.

Under Genito-urinary Organs it contains an excellent summary of the surgical procedures adapted for the cure of lesions calling for surgical intervention.

For a book of this kind the section on Deformities of the Penis is unusually full. Unqualified praise is given to the therapeutic effect of antigonococcic serum and vaccination. The usual gynecological operations are described and illustrated. The infections of the hand are dealt with in accordance with the principles best formulated by Kanavel. Some orthopedic procedures are considered from the standpoint of the surgeon rather than the orthopedist. There is a section on Amputations, but not in entire accord with modern practice. For instance, the use of the periosteal flap which the author commends is at present deprecated because of the danger of spur formation. The work of Ceci and Vanghetti is properly set forth, indeed at greater length and in more detail than is to be found in any other text-book. A highly desirable addition to this book is a section on Artificial Appliances and the Re-education of the Crippled.

A brief, but most satisfactory, section upon Plastic and Cosmetic Surgery, setting forth the underlying principles and giving many of the applications.

The illustrations of circular bandaging are particularly good.

In the Appendix are found many of the useful lessons developed by War Surgery. For instance, Gwathmey's administration of ether by the stomach as a preparation for painful dressings. Cotton ether. There is mention of flavine, of brilliant green, of magnesium sulphate. For delirium tremens the free use of alkalies is advised. in desperate cases intravenously. The flapless method of amputating for gas gangrene has not stood the test of large clinical experience.

COMPLETE INDEX TO VOLUMES I, II, AND III OF WARBASSE'S SURGICAL TREATMENT. W. B. Saunders Company, Philadelphia and London, 1919.

This index renders accessible the enormous amount of material contained in these almost encyclopedic volumes. Testing it out and taking at random a title such as sacroiliac disease the seeker after truth finds appropriate reference to the joint itself, to bone grafts, to diseases and injuries, to relaxation, sprains, strains, and tuberculosis. Or again, choosing at random a topic such as antiseptics, there is a proper reference to the treatment of infected wounds, with allusion to intravenous injection, and septicemia of known origin; and three further subheadings, one entitled Local Urinary, the other Bronchiectasis, the third Eye Use.

Under Individual Antiseptics we find the chlorine compounds, carbolic acid, bichloride of mercury, bipp paste, and the mention of practically all those in common or at times in uncommon use.

This is a needful and useful supplement to the large material collected by the author.

CORRESPONDENCE.

FORMIDINE FOR INTESTINAL PARASITES.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: In reading over the revised sixteenth edition of your "Practical Therapeutics" it was noticed that you included the drug "formidine" in the list. For a number of years the doctors in the tropics were unable to find a drug that would rid the intestines of such parasites as cercomonas, trichomonas, and lamblia; also strongyloides. Formidine gave me very good results in these cases from a dose of 10 grains t. i. d.

It may also be of interest to you to call your attention to the good results obtained by the use of emetine-bismuth-iodide in amebic dysentery.

Sincerely,

PAUL M. LOWELL, M.D., Jefferson, A.B., D.T.M., D.P.H. (Univ. of Penna.).

HARBIN, MANCHURIA, March 7, 1919.